THE ULTIMATE DIVE
XSTREAM SERVICE MANUAL

GÖTEBORG SWEDEN
POSEIDON

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1. Safety regulations

The instructions in this handbook must be followed in detail step by step. Negligence can cause serious injury or even death.

Special warnings are marked with this symbol

Xstream Deco and Xstream Duration, are used by the customer with gasses with elevated oxygen content. This requires special procedures while servicing; to clean the regulator and to keep it clean. Negligance to follow the instructions given in this manual introduces a risk for the customer of having a fire which in turn can cause serious injury or even death. Servicing the above-mentioned regulators, shall always be conducted in a clean environment using clean tools, as described in section 6 and in Appendix B.

To enhance safety during servicing, the regulators Xstream Deco and Xstream Duration shall be tested using clean air according to specification in 8. There is no need to test regulators in the servicing environment using gasses with > 21% oxygen.

Servicing must only be carried out by persons who have been trained and certified by Poseidon. Servicing Xstream Deco and Xstream Duration requires an additional certification as "POSEIDON OXYGEN TECHNICIAN"

Only POSEIDON original parts may be used for servicing. Where stated, POSEIDON original tools must be used.

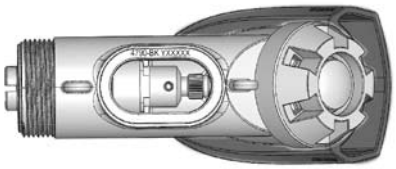
2. Introduction

Markings

This manual contains servicing and repair instructions and product information for the Poseidon Xstream regulator series. The different Xstream regulator models are most clearly identifed by their color. There is always a possibility that the customer has altered the colors himself, why it is important always to check the permanently marked article number as part of the identification of the product. The pictures below show where to find the article and serial number:

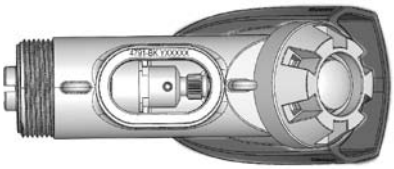
4790-BK / 002-10

Xstream Deep / Xstream Deep (4+1)



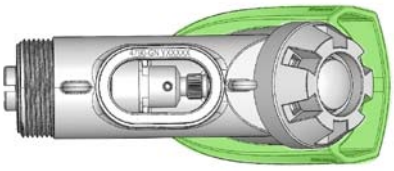
4791-BK / 001-47

Xstream Deep90 / Xstream Deep90 (5+2)



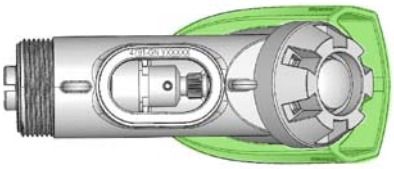
4790-GN/ 002-13 /4882-GN

Xstream Duration/Xstream Duration(4+1)/Xstream Duration EN 144-3



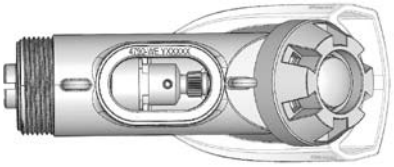
4791-GN/ 001-87 /4881-GN

Xstream Duration90/Xstream Duration90(5+2)/Xstream Duration90 EN 144-3



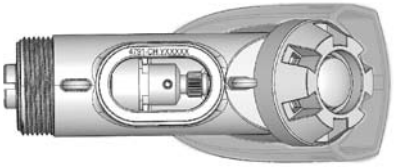
4790-WE/ 002-16 /4882-WE

Xstream Deco/Xstream Deco (4+1)/Xstream Deco EN 144-3

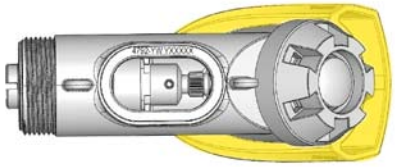


4791-CH

Xstream Dive90



4792-YW Xstream Dive Octopus



- CE 0120 Meets or exceeds requirements in EU Directive 89/686/EEC, Personal Protective Equipment. Manufacturing assessment carried out by notified body SGS Yarsley, ID no. 0120.
- 4790-BK Model identification
- E.g 200001 Serial number, 7 digit, 1st digit denotes year of manufacture
- WP 300bar Working pressure 300 bar
- Oxygen Approved for use with 99.95% oxygen
- Nitrox 50% Approved for use with maximum 50% oxygen

Service hamdbook

This servicing handbook is available for download at the Extranet at http://www.poseidon.se. Make sure you have the latest issue before undertaking any servicing. The handbook is available in English only.

Further assistance can be reached between 8:00 am to 4:30 pm (GMT+1) at Poseidon Diving Systems:
Ph. +46 (0)31 7342900 ask for “technical assistance”
Fax +46 (0)31 7342901
e-mail info@poseidon.se

Symbols used throughout the handbook

Icon	Description	Other information
	Remove old part. Destroy and give back to customer	
	Replace with new part	
	Visually inspect	
1	Poseidon grease #1, article no 8515	
2	Poseidon grease #2, article no 8507	
R	Poseidon grease #R, article no 8516	
	Warning. Negligence can cause serious injury or even death.	

Improvements

Poseidon has made several improvements, all introduced 2003 starting with serial number 310001. Also a 6:th member of the Xstream family is introduced – the Xstream Dive. Correspondingly, article numbers have been changed to reflect these improved models. Article numbers with the two first digits being 45 has been changed to 47. Wherever any text throughout this document refers to article numbers starting with 47, it also applies to the corresponding part/product having an article number starting with 45 i.e. Item number 4790-BK is the new version of old Xstream 4590-BK.
Starting in 2006, all Xstream 1st stages are equipped with an adjustment screw cover. Older versions with no adjustment screws should be upgraded.

Product upgrades

Regulators with serial numbers less than 310001 are subject to a mandatory update programme. To obtain updated replacement parts, order the kit 4826 and submit to Poseidon the serial number of the regulator by sending an email to service@poseidon.se with the serialnumber and date of service clearly marked.

Regulators fulfilling this criteria shall have the following parts replaced on its first service:

- 4560 replaced by 4760 Seat holder. Seats on regulators numbered after 310001 are different and will not fit older seat holders.
- 4577 replaced by 4777 Lower pin-guide. The part has been changed to withstand a greater torque.
- 4562 replaced by 4762 Upper centre piece. The part has been changed to correspond to the change of 4577
- 4581 Washer. The part has been changed to ease assembly through a more precise fit.

- 4423 O-ring
- 4563 Pin bushing 1.stage Xstream

Information about Xstream Upgrade kit 4826

4760 Seat holder and 4581 Washer are not critical parts to replace, however old seat holders will not fit new seats and is therefore included in the Update kit Xstream at a special price. 4777 Lower pin-guide and 4762 Upper centre piece should be replaced and is therefore included in the kit at no cost.

Information about Xstream 1st stage covers.

During 2006, we began manufacturing Xstream DEEP, DEEP90, DURATION, DURATION90 and DECO 1st stages with chrome colored 1st stage covers with an adjustment screw. Starting january 2007, all Xstream 1st stages, regardless of model/version, will have a chrome colored 1st stage cover with an adjustment screw.

Information about Xstream Upgrade to cover with adjustment screw.

Any Xstream 1st stages that don't have a cover with an adjustment screw should be upgraded with a cover that has an adjustment screw. This upgrade is not mandatory but recommended.
The upgrade is made using the "Xstream Adjustable kit" (4767-KIT) that contains the following parts:

- 1 x 4767-CE Xstream cover
- 1 x 4798-CH Adjustment screw
- 1 x 4766 Adjustment spring
- 1 x 4761 Seat spring

All these parts must be replaced when upgrading the 1st stage!

Recommendations

For regulators with serial numbers less than 310001 we recommend to offer the customer to replace the old type valve housing nut to the improved version with article number 4547. This will significantly reduce the inhalation effort. However if the customer choses to keep his old valve housing nut it is perfectly safe to do so.

EN 144-3

Xstream Deco, Xstream Duration and Xstream Duration90 are available also in EN 144-3 configurations, i.e., regulators which comply with the new EN 144-3 standard. See page 3 for correct article numbers.
Older Xstream models can be upgraded to comply with the same standard using an EN 144-3 upgrade kit. See Spare Parts lists on page 13 for details.

3. Determination of required service

IMPORTANT

To be covered by the Poseidon Lifetime Warranty program, all Xstream regulators must be serviced at least once every 24 months.

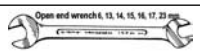
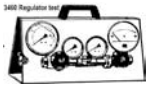
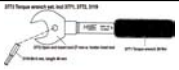
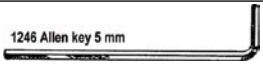
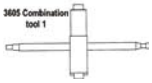
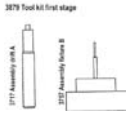
The serviced regulator must also be registered on the Poseidon Extranet (www.poseidon.se).

It is always acceptable to do a service or cleaning upon customers request.

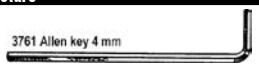
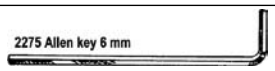
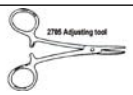
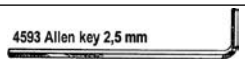
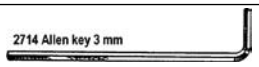
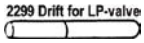
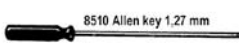
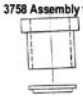
Customer:

4. Tools and tool order form

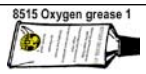
To service Poseidon regulators there is a number of tools required. Some of the tools are special tools for Xstream and Poseidon and some other tools are standard tools available in most hardware stores. Below you will find a list of all tools needed, with a description of what it is used for. Whenever you need to order a special Poseidon tool it is a good idea to copy this page and use it as an order form. Fill in the number of tools required and fax it to the Poseidon distributor in the country where you are situated. Don't forget to write the name of your shop in the head of this page.

Item	Description	Xstream	Jetstream	Cyklon	Triton	Valves	Picture	Ord. qty
2297 O-ring remover	Used to remove o-rings.	o	o	o	o	o		
Open end wrench 6, 13-23 mm	Various open end wrenches in millimeters are essential or assembly and dissassembly of various things.	o	o	o	o	o		
4462 Pliers	A specially made, pair of pliers to be used when pulling out locking pins from MPV valves and cutting the mouthpiece strap.	o	o	o	o	o		
3460 Regulator test	Used to check or finally adjust the regulator.	o	o	o	o			
4830 Ultra Sonic Cleaner	Used to clean all regulators. Mandatory for Xstream Deco and Duration.	o	o	o	o			
3773 Torque wrench set	Used to set the torque on various parts of the regulator.	o	o	o	o			
1246 Allen key 5 mm	Used to unscrew blindplugs and to adjust IP on Xstream.	o	o	o	o			
2705 Allen key 1,5 mm	Used to untighten and tighten the locking screw on Jetstream and Xstream valve tube and stopscrews on most first stages.	o	o	o	o			
2150 Plastic band pliers	Used to tighten the plastic band around the mouthpiece so that the mouthpiece doesn't turn around.	o	o	o	o			
3605 Combination tool 1	Used to to screw and unscrew various parts on the first stage and second stages.	o	o	o				
3606 Combination tool 2	Used to to screw and unscrew various parts on the first stage and second stages.	o	o	o				
3774 Bit holder for yoke	Used to hold the short bit 2883 when dissassembling and assembling the yoke connection on regulators with fixed yoke.		o	o	o			
2883 Bit 6 mm, L 30 mm	Used when dissassembling and assembling regulators with fixed yoke. Not for G5/8" connections.		o	o	o			
3397-10 Fixture for first stages	Used to hold the first stage during dissassembly or assembly.		o	o	o			
3876 Tool kit for first stage	Used to mount all inner details on first stages of type 3720, 3790 and 3880.		o	o	o			

Customer:

Item	Description	Xstream	Jetstream	Cyklon	Triton	Valves	Picture	Ord. qty
3761 Allen key 4 mm	Used to unscrew and screw safety valve on first stages type 3720 and 3790.		o	o	o			
2275 Allen key 6 mm	Used to untighten the connection stem on all first stages and to adjust IP on first stages.		o	o	o			
2893 Screw driver 3,5 mm 3372 Screw driver 5,5 mm (short) 2885 Screw driver 8,5 mm	Used for various things; Old Jetstream second stage covers, adjusting Cyklon valve tube, tank valves etc.		o	o		o		
2705 Adjusting tool	Used to adjust the cracking pressure on Jetstream and Xstream.	o	o					
2894 Test fixture for LP-valve	Used to test the leaktightness in water on Jetstream and Xstream servo valve.	o	o					
Small pair of scissors	Not sold by Poseidon	o						
4592 Oxygen cleaned G5/8" wheel	Used as an oxygen clean interface between regulator and testbox while checking and setting.	o						
4593 Allen key 2,5 mm	Used to unscrew and screw the first stage spring cover on Xstream. (3 screws)	o						
4591 17 mm torque wrench	Used to untighten and tighten the connection stem on Xstream first stages.	o						
4594 Handle UNF 3/8"	Used to hold straight Xstream models when untightening and tightening the connection stem.	o						
2714 Allen key 3 mm	Used to unscrew and screw blindplugs on first stages, type 3580.		o					
2895 Screw driver Pozi 1	Used to unscrew and screw Jetstream second stage cover. (4 screws)		o					
2112 Assembly tool	Used to mount together the metal cover and the metal housing and at the same time mount the locking ring on all Cyklon second stages.			o				
2299 Drift for LP-valve	Used to hold together the LP-valve and the spring in the Cyklon second stage when mounting the locking ring.			o				
3138 Holder for drift 2299	To be placed on a table and with the 2299 drift inserted. Gives you a greater force when holding together the Cyklon LP-valve.			o				
1304 Awl	Used when removing locking rings.			o				
8510 Allen key 1,27 mm	Used to adjust the cracking pressure on Triton second stages.				o			
3758 Assembly fixture	Used when inserting o-rings into Triton second stage swivel.				o			

Customer:

Item	Description	Xstream	Jetstream	Cyklon	Triton	Valves	Picture	Ord. qty
3761 Dismounting tool Triton	Used when dismounting Triton LP-valve.				o			
4461 Drift	Used as a guide when installing locking pins on MPV valves					o		
4463 Torque wrench head	To be used when tightening MPV valves on tanks. To be used with a torque wrench.					o		
Articles of consumption								
8515 Oxygen grease #1	Only approved oxygen grease when lubricating oxygen critical parts on the high pressure side. Approved for 300 bar 60°C.	o						
8507 Oxygen grease #2	Used when lubricating oxygen critical parts on the low pressure side. Approved for 110 bar 60°C.	o	o	o	o	o		
8516 Regulator grease	Used for lubrication of air version regulators.	o	o	o	o	o		
3139 Oil silicone 20 g	Used for lubrication of air version regulators.			o	o			
4835 Poseidon fine clean ultra	5 litre	o						
4837 Lint free latex gloves		o						
4838 Hair net		o						

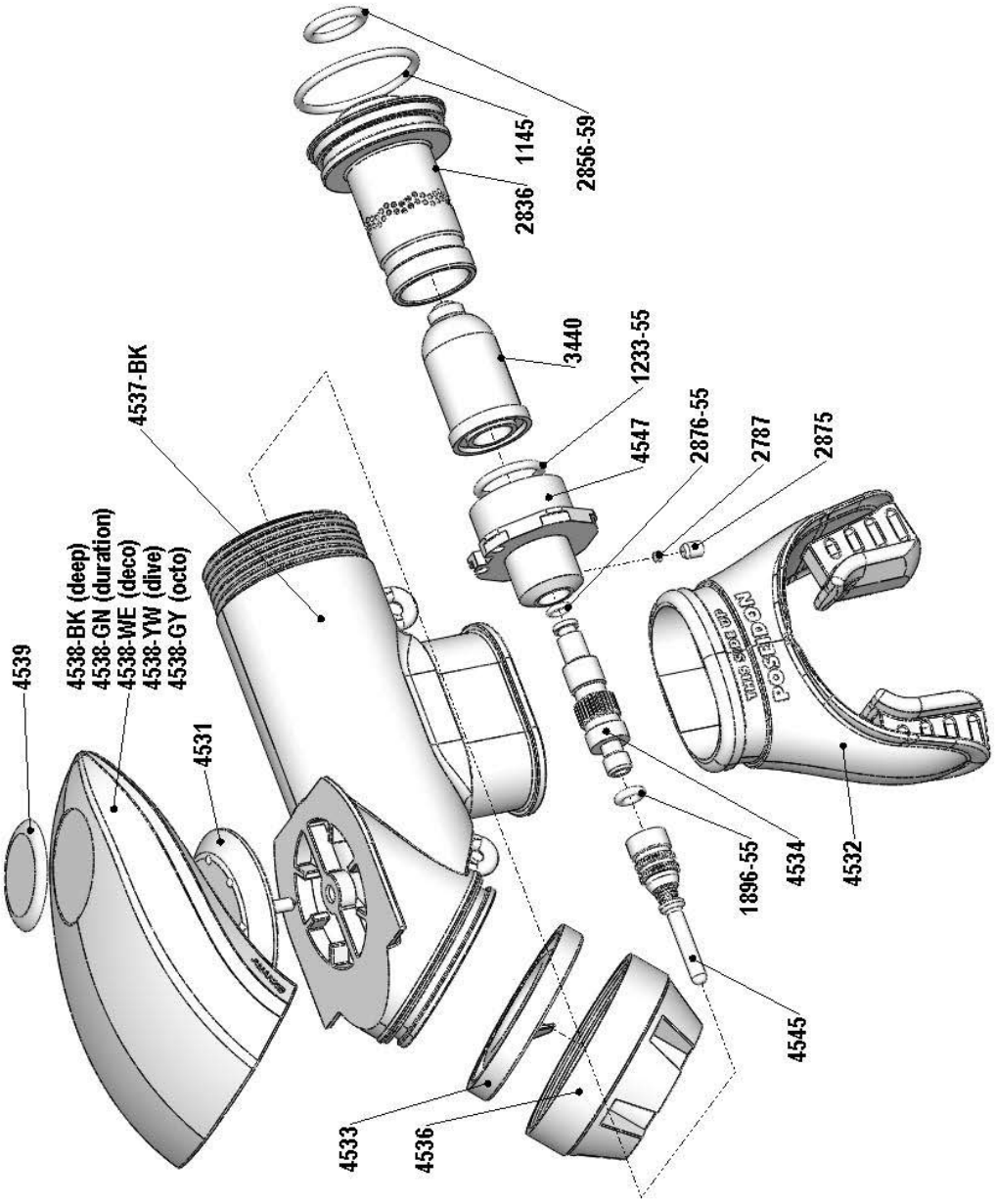
5. Spare parts & service kits

Customer:

Second stages

4670-BK	Second stage Xstream Deep
4670-GN	Second stage Xstream Duration
4670-WE	Second stage Xstream Deco
4670-GY	Second stage Xstream Dive
4670-YW	Second stage Xstream Octopus

Item #	Description	Qty
4536	Diaphragm cover	
4533	Diaphragm silicone	
4538-BK	Cover Xstream 2nd stage (Deep)	
4538-WE	Cover Xstream 2nd stage (Deco)	
4538-GN	Cover Xstream 2nd stage (Duration)	
4538-YW	Cover Xstream 2nd stage (Octopus)	
4538-GY	Cover Xstream 2nd stage (Dive)	
4539	Sticker Poseidon Xstream	
4531	Checkvalve	
4537-BK	Housing	
2856-59	O-ring Xstream 2nd st., viton	
1145	O-ring	
2857	LP-valve housing	
3440	Valve insert	
1233-55	O-ring 2nd stage Xstream, EPDM	
4547	Valve housing nut, Xstream	
2787	Rubber plate	
2875	Stop screw	
1167	Locking strap	
4532	Mouthpiece AIR	
2876-55	O-ring 2nd stage Xstream, EPDM	
4534	Valve tube Xstream	
1896-55	O-ring 2nd stage Xstream, EPDM	
4545	Servo-valve Xstream	

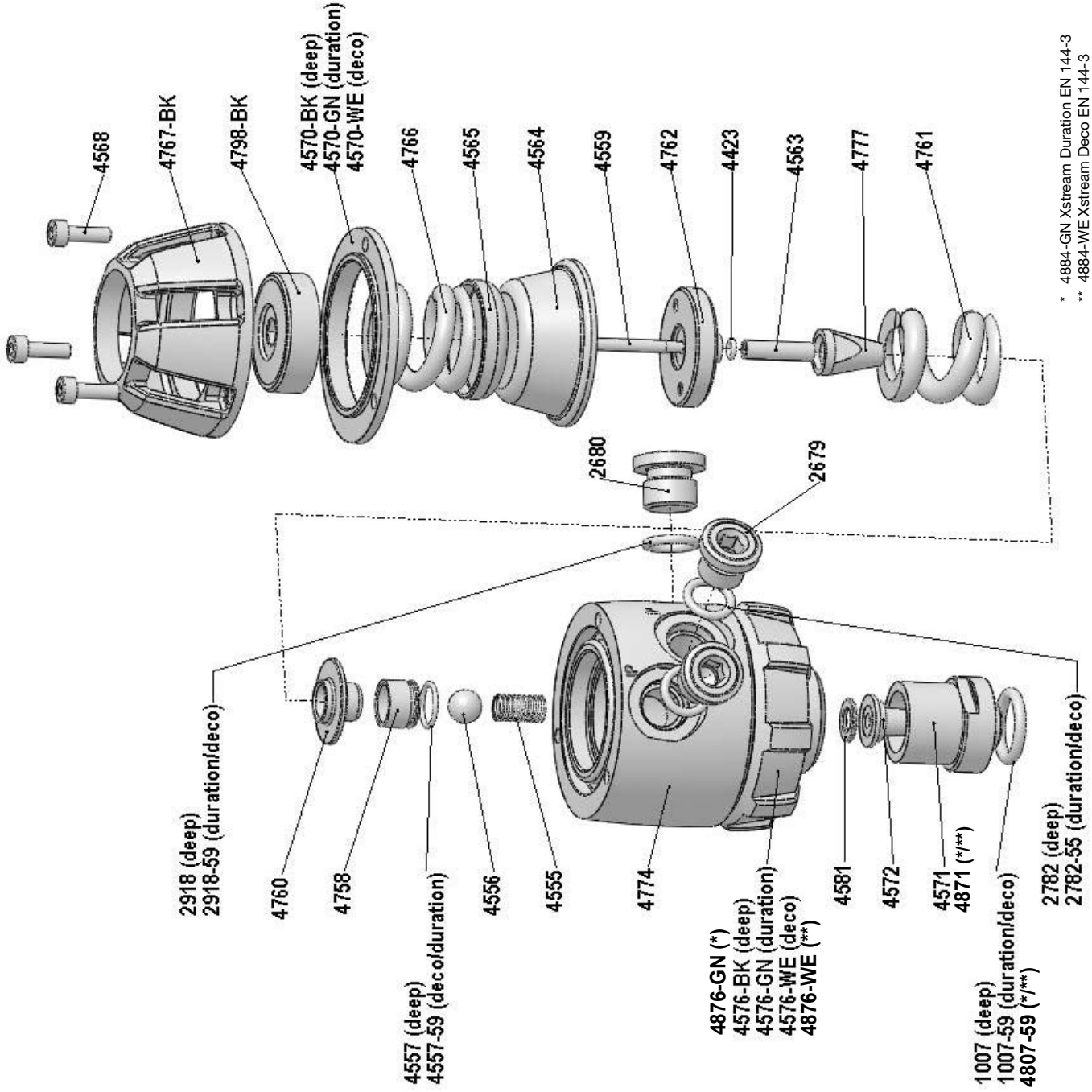


Customer:

First stage bottom mounted

4780-BK	1st stage G 5/8" Xstream DEEP	002-09 1st stage G 5/8" Xstream DEEP (4+1)
4780-GN	1st stage G 5/8" Xstream DURATION	002-12 1st stage G 5/8" Xstream DURATION (4+1)
4780-WE	1st stage G 5/8" Xstream DECO	002-15 1st stage G 5/8" Xstream DECO (4+1)
4884-GN	1st stage Xstream DURATION EN 144-3	
4884-WE	1st stage Xstream DECO EN 144-3	

Item #	Description	Qty
1007	O-ring (Deep)	
1007-59	O-ring, viton (Deco/Duration)	
4807-59	O-ring, viton (*/**)	
4571	Conn. stem 1.stage Xstream	
4871	Conn. stem 1.stage Xstream (*/**)	
4572	Cup type filter Xstream	
4581	Stainl. washer 1.stage Xstream	
4576-BK	Wheel G5/8" Xstream, black	
4576-WE	Wheel G5/8" Xstream, white	
4576-GN	Wheel G5/8" Xstream, green	
4876-GN	Wheel Xstream, green (*)	
4876-WE	Wheel Xstream, white (**)	
4774	Housing 1.stage Xstream	
4555	Spring for ball Xstream	
4556	Ball 1.stage Xstream	
4557	O-ring (Deep)	
4557-59	O-ring, viton (Deco/Duration)	
4758	Zytel valve seat Xstream	
4760	Valve seat holder Xstream	
4761	Valve seat spring Xstream	
4777	Lower pin guide Xstream	
4563	Pin bushing 1.stage Xstream	
4423	O-ring	
4762	Upper pin guide Xstream	
4559	Actuating pin, Xstream	
4564	Roll.diaphragm 1.stage Xstream	
4565	Pressure plate 1.stage Xstream	
4766	Adjust. spring 1.stage Xstream	
4570-BK	Barrier 1.stage Xstream black	
4570-WE	Barrier 1.stage Xstream white	
4570-GN	Barrier 1.stage Xstream green	
4767-BK	Cover Xstream 1st stage, black	
4767-CE	Cover Xstream 1st stage, chrome	
4568	Screw cover M3x10 Xstream, 3 pcs	
4798-BK	Adjustment screw, black	
4798-CE	Adjustment screw, chrome	
2680	Blindscrew UNF7/16	
2918	O-ring (Deep/Dive)	
2918-59	O-ring, viton (Deco/Duration)	
2679	Blindscrew UNF3/8, 2 pcs	
2782	O-ring (Deep/Dive)	
2782-55	O-ring, EPDM (Deco/Duration)	



* 4884-GN Xstream Duration EN 144-3
** 4884-WE Xstream Deco EN 144-3

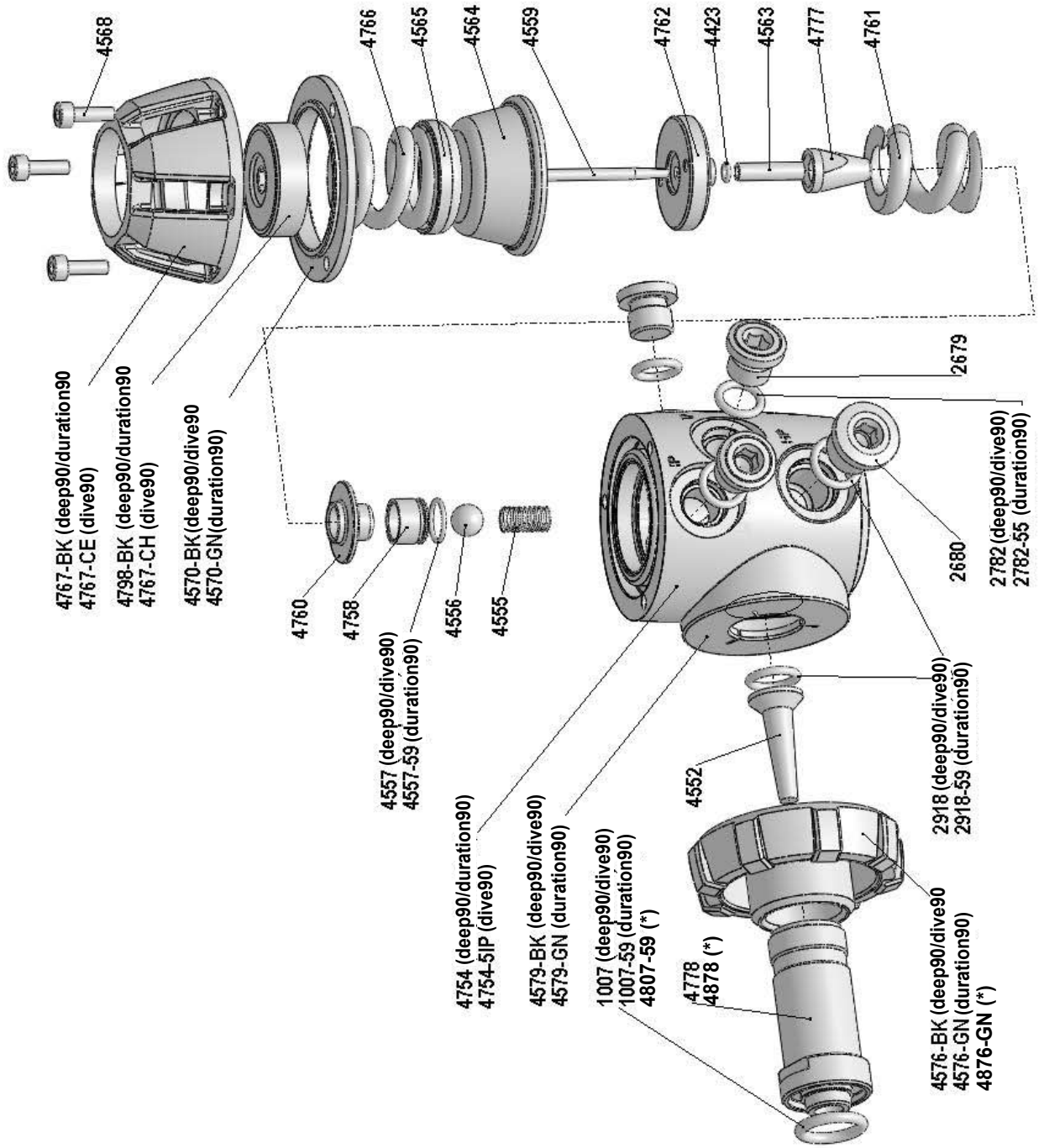
Customer:

First stage 90

4751-BK 1st stage G 5/8"Xstream DEEP90
4751-GN 1st stage G 5/8"Xstream DURATION90
4752-BK 1 st stage G 5/8" Xstream DIVE90, DEEP90 (5+2)
4883-GN 1 st stage Xstream DURATION90 EN 144-3

001-85 1st stage G 5/8" Xstream DURATION90 (5+2)

Item #	Description	Qty
1007	O-ring (Deep90/Dive90)	
1007-59	O-ring, viton (Duration90)	
4807-59	O-ring. viton (Duration90 EN 144-3)	
4778	Conn. stem 1.stage 90 Xstream	
4878	Conn. stem 1.stage Duration90 EN 144-3	
4552	Cup type filter long Xstream 90	
2918	O-ring (Deep90/Dive90)	
2918-59	O-ring (Duration90)	
4579-BK	Line protector Xstream, black	
4579-GN	Line protector Xstream, green	
4754	Housing 1.stage 90 Xstream	
4754-5IP	Housing 1.stage Dive 90, Deep 90, Duration 90 Xstream (5+2 versions)	
4555	Spring for ball Xstream	
4556	Ball 1.stage Xstream	
4557	O-ring (Deep90/Dive90)	
4557-59	O-ring, viton (Duration90)	
4758	Zytel valve seat Xstream	
4760	Valve seat holder Xstream	
4761	Valve seat spring Xstream	
4777	Lower pin guide Xstream	
4563	Pin bushing 1.stage Xstream	
4423	O-ring	
4762	Upper pin guide Xstream	
4559	Actuating pin, Xstream	
4564	Roll.diaphragm 1.stage Xstream	
4565	Pressure plate 1.stage Xstream	
4766	Adjust. spring 1.stage Xstream	
4570-BK	Barrier 1.stage Xstream black	
4570-GN	Barrier 1.stage Xstream green	
4767-BK	Cover Xstream 1st stage, black	
4767-CE	Cover Xstream 1st stage, chrome	
4568	Screw cover M3x10 Xstream, 3 pcs	
4798-BK	Adjustment screw, black	
4798-CE	Adjustment screw, chrome	
2680	Blindscrew UNF7/16	
2918	O-ring (Deep90/Dive90)	
2918-59	O-ring, viton (Duration90)	
2679	Blindscrew UNF3/8, 3 pcs	
2782	O-ring (Deep90/Dive90)	
2782-55	O-ring, EPDM (Duration90)	
4576-BK	Wheel G5/8" Xstream, black	
4576-GN	Wheel G5/8" Xstream, green	
4876-GN	Wheel Xstream, green (Duration90 EN 144-3)	



* 4883-GN Xstream Duration90 EN 144-3

Customer:

Servicekits

4821 Servicekit Xstream Deep 1:st stage				Ord. qty
Included:	4758	Zytel valve seat Xstream	1 pc	
	4572	Cup type filter Xstream	1 pc	
	2782	O-ring (Deep/Dive)	3 pcs	
	2918	O-ring (Deep/Dive)	2 pcs	
	4557	O-ring (Deep/Dive)	1 pc	
	4423	O-ring	1 pc	
	1007	O-ring (Deep/Dive)	1 pc	

4822 Servicekit Xstream Deep90, Dive90 1:st stage				Ord. qty
Included	4758	Zytel valve seat Xstream	1 pc	
	4552	Cup type filter long Xstream 90	1 pc	
	2782	O-ring (Deep/Dive)	5 pcs	
	2918	O-ring (Deep/Dive)	3 pcs	
	4557	O-ring (Deep/Dive)	1 pc	
	4423	O-ring	1 pc	
	1007	O-ring (Deep/Dive)	1 pc	
Note:	Servicing a Deep90 leaves you 2 2782 and 1 2918.			

4823 Servicekit Xstream Duration, Deco 1:st stage				Ord. qty
Included:	4758	Zytel valve seat Xstream	1 pc	
	4572	Cup type filter Xstream	1 pc	
	4563	Pin bushing 1.stage Xstream	1 pc	
	2782-55	O-ring, EPDM (Deco/Duration)	3 pcs	
	2918-59	O-ring, viton (Deco/Duration)	2 pcs	
	4557-59	O-ring, viton (Deco/Duration)	1 pc	
	4423	O-ring	1 pc	
	1007-59	O-ring, viton (Deco/Duration)	1 pc	

4827 Servicekit Xstream Duration EN 144-3, Deco EN 144-3 1:st stage				Ord. qty
Included:	4758	Zytel valve seat Xstream	1 pc	
	4572	Cup type filter Xstream	1 pc	
	4563	Pin bushing 1.stage Xstream	1 pc	
	2782-55	O-ring, EPDM (Deco/Duration)	3 pcs	
	2918-59	O-ring, viton (Deco/Duration)	2 pcs	
	4557-59	O-ring, viton (Deco/Duration)	1 pc	
	4423	O-ring	1 pc	
	4807-59	O-ring, viton EN 144-3	1 pc	

4824 Servicekit Xstream Duration90 1:st stage				Ord. qty
Included:	4758	Zytel valve seat Xstream	1 pc	
	4552	Cup type filter long Xstream 90	1 pc	
	4563	Pin bushing 1.stage Xstream	1 pc	
	2782-55	O-ring, EPDM (Deco/Duration)	3 pcs	
	2918-59	O-ring, viton (Deco/Duration)	2 pcs	
	4557-59	O-ring, viton (Deco/Duration)	1 pc	
	4423	O-ring	1 pc	
	1007-59	O-ring, viton (Deco/Duration)	1 pc	

4828 Servicekit Xstream Duration90 EN 144-3 1:st stage				Ord. qty
Included:	4758	Zytel valve seat Xstream	1 pc	
	4552	Cup type filter long Xstream 90	1 pc	
	4563	Pin bushing 1.stage Xstream	1 pc	
	2782-55	O-ring, EPDM (Deco/Duration)	3 pcs	
	2918-59	O-ring, viton (Deco/Duration)	2 pcs	
	4557-59	O-ring, viton (Deco/Duration)	1 pc	
	4423	O-ring	1 pc	
	4807-59	O-ring, viton EN 144-3	1 pc	

4825 Servicekit Xstream 2nd stage				Ord qty
Included:	1167	Locking strap	1 pc	
	2787	Rubber plate	1 pc	
	1145	O-ring	1 pc	
	1233-55	O-ring 2nd stage Xstream, EPDM	1 pc	
	2856-59	O-ring Xstream 2nd st., viton	1 pc	
	2876-55	O-ring Xstream 2nd st, EPDM	1 pc	
	1896-55	O-ring Xstream 2nd st , EPDM	1 pc	

Xstream Upgrade Kit

4826 Xstream upgrade kit for models below s/n 310001				Ord qty
Included:	4760	Valve seat holder Xstream	1 pc	
	4777	Lower pin guide Xstream	1 pc	
	4762	Upper pin guide Xstream	1 pc	
	4581	Stainl. washer 1.stage Xstream	1 pc	
	4423	O-ring	1 pc	
	4563	Pin bushing 1st stage Xstream	1 pc	
Note:	Servicing a Xstream 90 model leaves you 1 pcs washer 4581.			

4767-KIT Xstream adjustment kit for Xstream 1st stages with no adjustmentscrew				Ord qty
Included:	4767-CE	Xstream 1st stage cover	1 pc	
	4798-CH	Adjustment screw	1 pc	
	4766	Adjustment spring	1 pc	
	4761	Seat spring	1 pc	
Note:	Fits all Xstream 1st stages			

Xstream EN 144-3 upgrade kits

4880-GN Xstream Duration EN 144-3 kit				Ord qty
Included:	4871	Connection stem Xstream Duration/Deco EN 144-3	1 pc	
	4807-59	O-ring EN 144-3	1 pc	
	4876-GN	Wheel Xstream Duration EN 144-3	1 pc	
	4572	Cup type filter Xstream	1 pc	

4851-GN Xstream Duration90 EN 14-3 kit				Ord qty
Included:	4878	Connection stem Xstream Duration90 EN 144-3	1 pc	
	4807-59	O-ring EN 144-3	1 pc	
	4876-GN	Wheel Xstream Duration EN 144-3	1 pc	
	4552	Cup type filter long Xstream 90	1 pc	
	2918-59	O-ring	1 pc	

4880-WE Xstream Deco EN 144-3 kit				Ord qty
Included:	4871	Connection stem Xstream Duration/Deco EN 144-3	1 pc	
	4807-59	O-ring EN 144-3	1 pc	
	4876-WE	Wheel Xstream Deco EN 144-3	1 pc	
	4572	Cup type filter Xstream	1 pc	

6. Service

The parts that needs to be replaced during a service are described in the Spare parts & Servicekits section of this handbook. Make sure that you have servicekits for the corresponding model and that you have all special tools required available. The tools required are described in the Tools section of this hand book.

For instructions on how to service the regulator follow the instruction below until you reach the "GO TO FINAL INSPECTION" text at the end of the instruction. The instructions in this handbook must be followed in detail step by step. Negligence can cause serious injury or even death.

A service includes the following 5 steps:

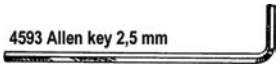
1. Complete disassembly of the first stage and second.
2. Inspection of disassembled parts.
3. Cleaning prior to assembly.
4. Assembly.
5. Final inspection and adjustment, please refer to section 7 of this handbook.

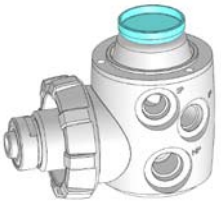
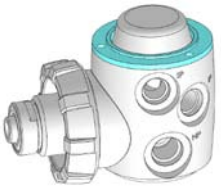
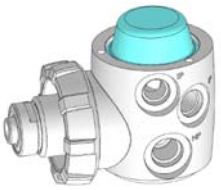
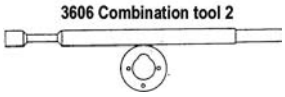
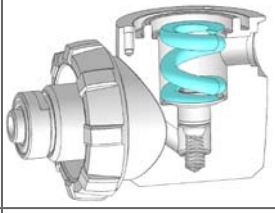
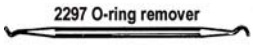
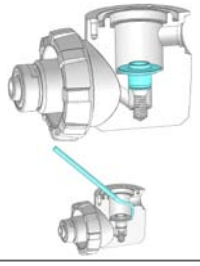
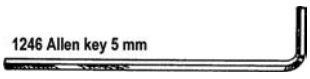
Disassembly

Do not disassemble the regulator in the clean room environment. All parts shall be taken to the clean room environment after inspection and after the pre-cleaning process if such is needed. Otherwise you risk to contaminate the clean room environment. New parts should be stored in it's original packing until it is time for assembly.

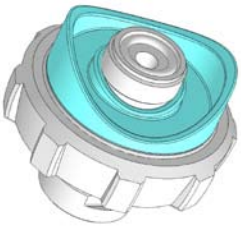
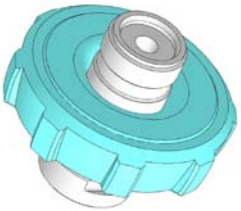
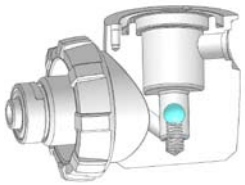
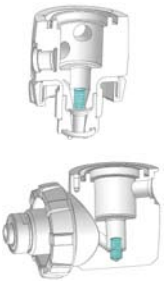
To remove o-rings, ONLY use o-ring remover tool 2297. Make sure not to damage o-ring and sealing surfaces!!

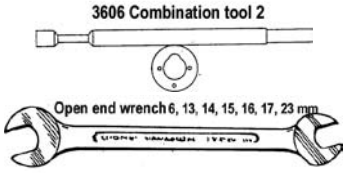
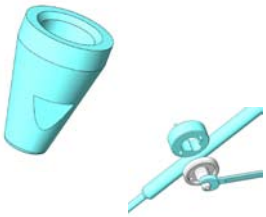
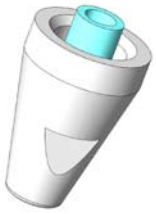
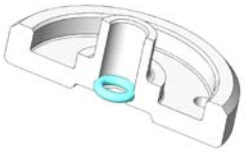
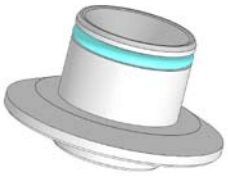
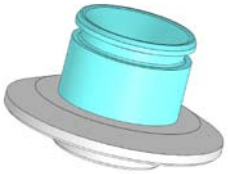
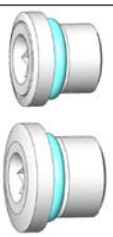
Xstream first stage

Step	Parts	Tools/Instructions	Replace	Picture
All first stages				
1	2680 Blindscrew UNF 7/16" 1 or 2 pcs 2679 Blindscrew UNF 3/8" 2, 3 or 5 pcs			
2	4568 Screw M3x10 Xstream 3 pcs			
3	4767-BK Cover Xstream first stage black 4767-CE Cover Xstream first stage chrome			
4	4766 Press. spring 1.stage Xstream			

Step	Parts	Tools/Instructions	Replace	Picture
5	4565 Pressure plate 1.stage Xstream			
6	4570-BK Barrier 1.stage Xstream black 4570-WE Barrier 1.stage Xstream white 4570-GN Barrier 1.stage Xstream green			
7	4564 Roll. diaphragm 1.stage Xstream	Only use fingers. Tools may puncture the diaphragm		
8	Pin guide assembly			
9	4761 Valve seat spring Xstream			
10a	4760 Valve seat holder Xstream 4758 Zytel valve seat Xstream			
10b	4760 Valve seat holder Xstream 4758 Zytel valve seat Xstream			
10c	4760 Valve seat holder Xstream 4758 Zytel valve seat Xstream			

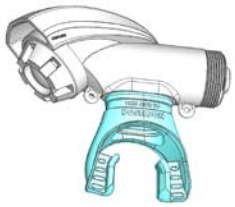
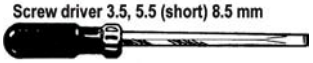
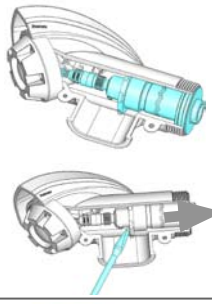
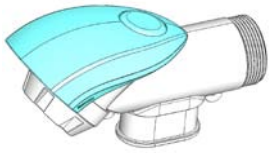
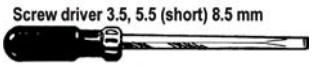
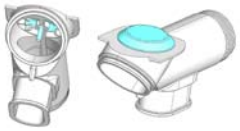
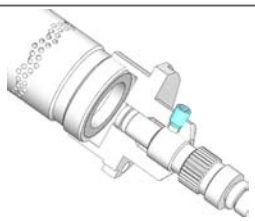
Step	Parts	Tools/Instructions	Replace	Picture
Only for Xstream bottom mounted first stages				
11	1007 O-ring (Deep) 1007-59 O-ring, viton (Deco/Duration) 4807-59 O-ring, viton EN 144-3 (Deco EN 144-3/Duration EN 144-3)	2297 O-ring remover		
12	4571 Conn. stem 1.stage Xstream 4871 Conn. stem 1.stage Xstream EN 144-3 (Deco EN 144-3/Duration EN 144-3)	4594 Handle UNF 3/8" 4591 17mm torque wrench head 3773 Torque wrench set, incl 3771, 3772, 3119		
13	4576-BK Wheel G5/8" Xstream, black 4576-WE Wheel G5/8" Xstream, white 4576-GN Wheel G5/8" Xstream, green 4876-GN Wheel Xstream Duration EN 144-3, green 4876-WE Wheel Xstream Deco EN 144-3, white			
14	4572 Cup type filter Xstream			
15	4581 Stainl. washer 1.stage Xstream			
Only for Xstream 90 first stages				
16	1007 O-ring (Deep90/Dive90) 1007 59 O-ring viton (Duration90) 4807-59 O-ring, viton EN 144-3 (Duration90 EN 144-3)	2297 O-ring remover		
17	4778 Conn. stem 1.stage 90 Xstream 4878 Conn. stem 1.stage EN 144-3 (Duration90 EN 144-3)	4591 17mm torque wrench head 3773 Torque wrench set, incl 3771, 3772, 3119		

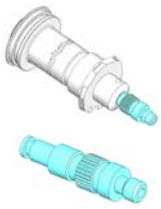
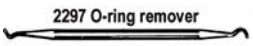
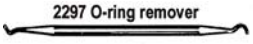
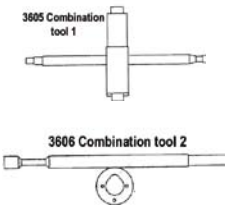
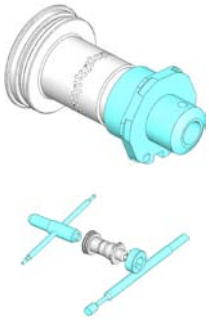
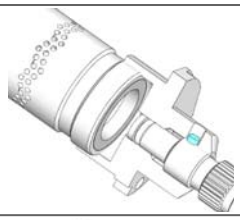
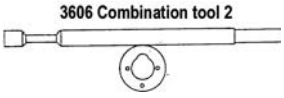
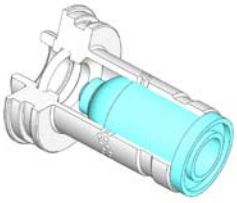
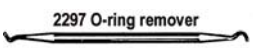
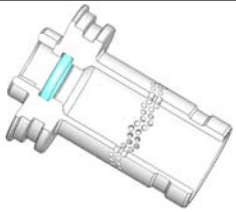
Step	Parts	Tools	Replace	Picture
18	4576-BK Line protector Xstream, black 4576-GN Line protector Xstream, green			
19	2918 O-ring (Deep90/Dive90) 2918-59 O-ring Viton (Duration90)			
20	4576-BK Wheel G5/8" Xstream, black 4576-GN Wheel G5/8" Xstream, green 4876-GN Wheel Xstream Duration EN 144-3, green			
21	4552 Cup type filter long Xstream 90			
All first stages				
22	4556 Ball 1.stage Xstream			
23	4555 Spring for ball Xstream			
24	4559 Actuating pin, Xstream			

Step	Parts	Tools	Replace	Picture
25	4777 Lower pin guide Xstream	3606 Combination tool 2  Open end wrench 6, 13, 14, 15, 16, 17, 23 mm 6 mm		
26	4563 Pin bushing 1.stage Xstream ⚠ Do not pull out nor replace the Pin bushing while servicing Dive or Deep models. This should only be done while servicing Deco and Duration models.	Screw in M3 screw 4568 in the pin bushing and pull out.		
27	4423 O-ring	2297 O-ring remover		
28	4557 O-ring (Deep/Dive) 4557-59 O-ring, viton (Deco/Duration)	2297 O-ring remover		
29	4758 Zytel valve seat Xstream			
30	<u>On blindscrew UNF 3/8”</u> 2782 O-ring Deep 2 or 3 pcs, Dive 5 pcs 2782 55 O-ring EPDM Deco 2 or 3 pcs Duration 2 or 3 pcs <u>On blindscrew UNF 7/16”</u> 2918 O-ring Deep 1 pcs, Dive 2 pcs 2918 59 O-ring Viton Deco/Duration 1 pcs	2297 O-ring remover		
31	4798 Adjusting screw	1246 Allen key 5 mm		

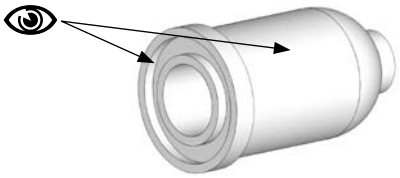
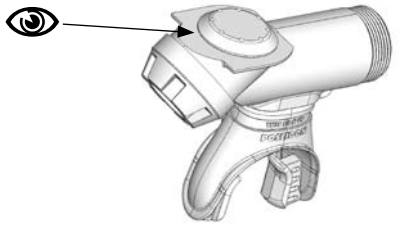
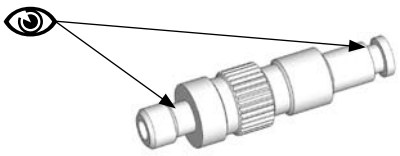
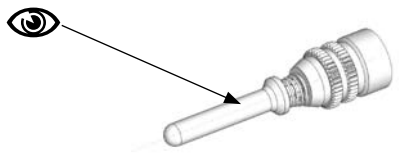
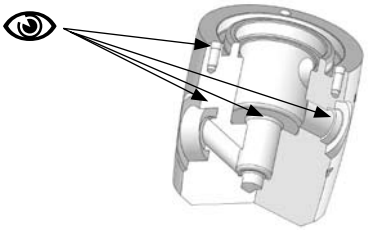
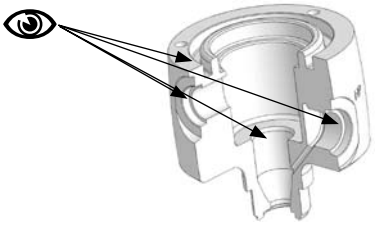
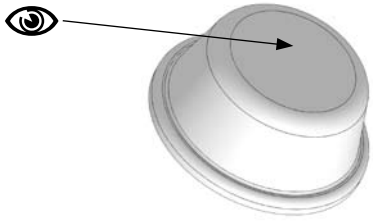
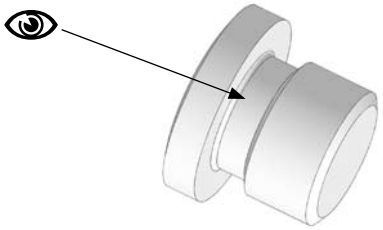
Xstream second stage

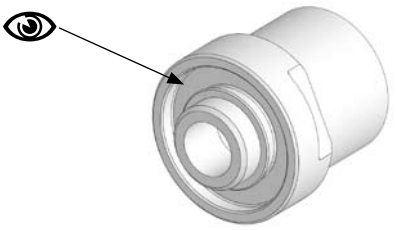
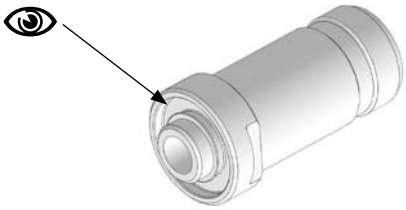
⚠ To remove o-rings, ONLY use o-ring remover tool 2297. Make sure not to damage o-ring surfaces!!Do not disassemble the exhalation check-valve, since this is not included in the servicing kit and can be hard to put back if taken out.

Step	Parts		Tools	Replace	Picture
1	4532	Mouthpiece AIR	4462 Pliers For cutting strap		
2			Screw driver 3.5, 5.5 (short) 8.5 mm 		
3	4538-BK 4538-WE 4538-GN 4538-YW 4538-GY	Cover Xstream 2nd stage (Deep) Cover Xstream 2nd stage (Deco) Cover Xstream 2nd stage (Duration) Cover Xstream 2nd stage (Octopus) Cover Xstream 2nd stage (Dive)	Twist off.		
4	4536	Diaphragm cover	Screw driver 3.5, 5.5 (short) 8.5 mm  Snap connection.		
5	4533	Diaphragm silicone			
6	4531	Checkvalve	**Do not remove! Unless damaged**		
7	4545	Servo-valve Xstream			
8	2875	Stop screw	2706 Allen key 1,5 mm		

Step	Parts		Tools	Replace	Picture
9	4534	Valve tube Xstream			
10	1896-55	O-ring 2nd stage Xstream, EPDM			
11	2876-55	O-ring 2nd stage Xstream, EPDM			
12	4547	Vavle housing nut, Xstream			
13	2787	Rubber plate			
14	1233-55	O-ring 2nd stage Xstream, EPDM			
15	1145	O-ring			
16	3440	Valve insert			
17	2856-59	O-ring Xstream 2nd st., viton			

Inspections

Step	Parts	Inspect	Picture
1	3440 Valve insert	1. Ensure no circular cuts on bladder surface. 2. Check O-ring sealing surface	
2	4531 Checkvalve	1. Check for damages on check valve edge	
3	4534 Valve tube Xstream	1. Check O-ring sealing surfaces	
4	4545 Servo-valve Xstream	1. Make sure not bent	
5	4754 Housing 1.stage 90 Xstream	1. Check sealing surfaces	
6	4774 Housing 1.stage Xstream	1. Check sealing surfaces	
7	4564 Roll.diaphragm 1.stage Xstream	1. Check for wear and tear	
8	2680 Blindscrew UNF7/16 2679 Blindscrew UNF3/8,	1. Check O-ring sealing surfaces	

Step	Parts	Inspect	Picture
9	4571 Conn. stem 1.stage Xstream 4871 Conn. stem 1.stage Xstream EN 144-3 (Deco EN 144-3/Duration EN 144-3)	1. Check O-ring sealing surfaces	
10	4778 Conn. stem 1.stage 90 Xstream 4878 Conn. stem 1.stage Xstream EN 144-3 (Duration90 EN 144-3)	1. Check O-ring sealing surfaces	

Cleaning

Xstream Deep/Dive Cleaning

Make absolutely sure Hydrochloric acid is NOT poured into the ultra-sonic cleaner. It would then destroy the ultra-sonic cleaner and the parts attempted to be cleaned.

If corrosion or salt deposits occurs on metallic parts, immerse part in concentrated Hempocid* or 15% Hydrochloric acid for about 10 minutes. Then rinse them thoroughly in fresh water and blow them dry with air. The synthetic parts must not be treated with solvents and must only be cleaned with fresh water.

*Hempocid=Acid Liquid detergent containing phosphoric acid (5-10%) and bactericide for disinfectant cleaning

Xstream Deco/Duration Cleaning for Oxygen Use

The process of cleaning for oxygen use and the information given herein shall be strictly adhered to. Only then can Poseidon guarantee the regulator will be cleaned to a cleanliness level which is acceptable for its intended use. This process has been verified to produce hydrocarbon residual levels less than 50mg/m2 and a particulate level less than Cleaning Test Level 100 (ASTM G 93 Spec.)

As an alternative, oxygen servicing procedures can be carried out in accordance with other herein listed organizations standard procedures and requirements. However, the use of cleaning agents, the order of the operating sequences and the time to treat parts during ultra sonic cleaning as specified in this manual must be adhered to. Wherever there is a conflict between the procedures and set of requirements, unless the other procedure represents a greater requirement for cleanliness, this manual takes precedence. Some methods, equipment, and detergents which are not mentioned in this manual can have a harmful or unknown effect on materials, such as e.g. ozone cleaning systems, strong acids etc. and shall therefore be discarded.

The other standard procedures that can be used given the limitations above are:
EAN and Oxygen Servicing Procedures, Fourth Edition (ANDI)
IANTD Gas Blender & Service Technician Program, First Edition, August 1999
MIL-STD-1330D (SH) of the 20 September 1996

The safety of your customer and yourself depends on you carefully and strictly following these instructions. Negligence in any step can cause serious injury or even death.

You must be certified by Poseidon as oxygen technician to undertake this procedure.

Keep hands and tools clean and free from grease, except for what is required and stated in this manual.

Use protective clothing to prevent dust, fingerprints, hair, and particles to contaminate.

Use only dedicated and cleaned tools.

Ensure your oxygen handling is in conjunction with national laws.

Ensure no foreign contaminants, such as e.g. liquids, grease, particulate, dust, and mist can enter into the cleanroom area.

The cleanroom area and work environment requirements

The cleanroom area and work environment should be setup according to minimum demands listed in Appendix D. A cleanroom area and work environment audit should be performed once a year either by a service technician or by a from Poseidon appointed auditor. The checklist in Appendix D should be used to make sure that all criterias are fulfilled. For detailed instructions on how to perform and audit please refer to Appendix D.

Preparations and Pre-cleaning

1. These preparations and the pre-cleaning shall NOT be conducted in the clean room, since it may then contaminate the clean room.
2. If any part is visibly contaminated, it shall be pre-cleaned, including the parts listed below which shall not be ultra sonic cleaned.
3. Only undertake the pre-cleaning if you are sure you can move on to the cleaning stage immediately after. If the parts dry between the two stages of operation, undesirable deposits can be left on part surfaces.

4. Bag the parts below in a plastic bag for later assembly. These parts shall not be ultra sonic cleaned.

5. Use IPA and a toothbrush to agitate away all visible contaminants. Rinse part(s) in municipal running water until all visible soil, particulate and cleaning agent is removed. When using IPA make sure you have sufficient ventilation. Please refer to the safety instructions of the IPA.
6. Use air of any quality to blow dry.

THE PROCESS BELOW SHOULD BE PERFORMED OUTSIDE THE CLEANROOM AREA

Cleaning

1. Wash your hands before this cleaning process.
2. Always ensure the UltraSonic cleaner is absolutely clean inside
3. Fill the UlraSonic cleaner with Poseidon FineClean Ultra and water in the ratio 1:5.
4. Let the UltraSonic cleaner reach its working temperature 60-70°C .
5. Place all parts in the basket. The parts shall be placed so that no air is trapped inside. Turn the part a few times under the solution until no bubbles are coming from it. Ultra Sonic cleaning agitates away contaminants, why it is important to finally place the part so that contaminants can drop out freely, i.e. open holes pointing down. (as shown in the figure). Ensure parts are not contacting each other, since that may reduce the cleaning effectiveness.
6. Immerse and ultra sonic clean the parts for 20-25 minutes
7. 3440, rolling diaphragm and the servovalve shall only be cleaned for 10 minutes
8. Bring all parts needed to assemble the complete regulator to the clean room. Keep the bagged 2nd stage parts and the service kit parts in their bags until immediately before assembly.

THE PROCESS BELOW SHOULD BE PERFORMED INSIDE THE CLEANROOM AREA

Rinsing and drying in the cleanroom

From this stage and through the assembly stages cleanroom clothing including gloves shall be used.

Pick up each part from the basket and rinse carefully under running water at least 30 seconds per part, or;
Rinse in two stages keeping the parts in the basket. Immerse the basket with the parts in another container of at least 3 litres of clean water and agitate for at least 5 minutes. Then replace the rinsing water with new clean water (ideally deionised, distilled, and filtrated water), and rinse for another 5 minutes. Ensure all cavities are carefully rinsed. It is the internal rinsing which is the most important!

Dry the parts by using a cleaned blowgun and clean air, and blow dry each part carefully.

Verification

White light
All parts shall be observed for the absence of contaminations under strong white light and for the accumulations of lint fibres. This method will detect particulate matter in excess of 50 microns and other contaminations in relatively large amounts. The part being examined must be recleaned if any contamination is detected using this method. You shall have access to, and use if found necessary, a magnifying glass or a microscope with at least x10 magnification.

Ultraviolet light (Black light)
Examine all parts in darkness using an ultraviolet light of between 3200 to 3800 Angstrom wavelength. If a bluish-white fluorescent blotch, smear, smudge, or film is present, the pert must be recleaned. Ultraviolet light inspection will help to verify that cleaned surfaces are free from any hydrocarbon fluorescence.

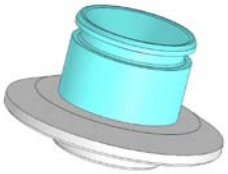
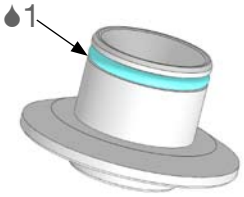
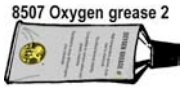
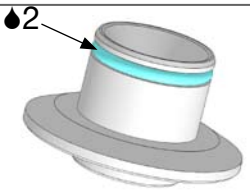
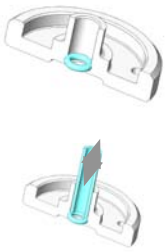
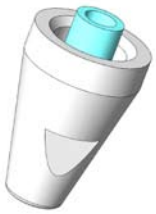
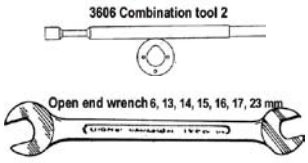
If parts cannot be used immediately for assembly, pack in clean plastic bags to avoid parts from being recontaminated.

Assembly

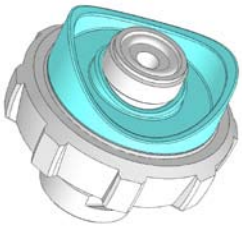
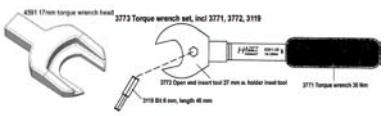
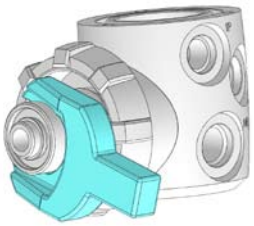
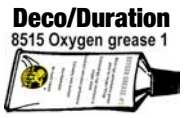
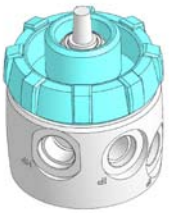
Lubricants shall be used sparingly. Excessive quantities of lubricant can trap particulate and other contaminants developing apotential fire hazard.

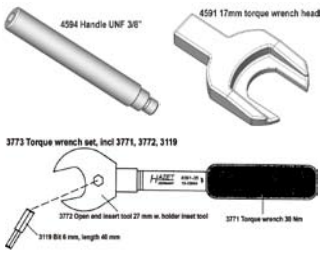
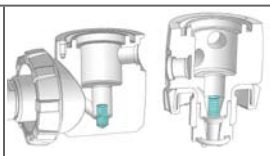
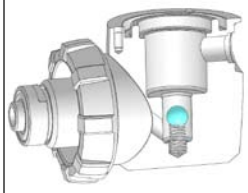
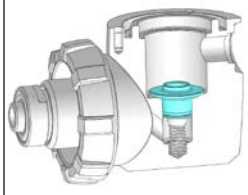
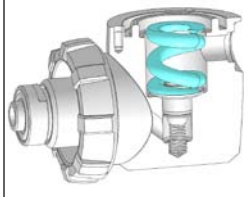
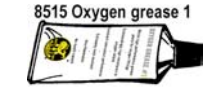
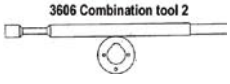
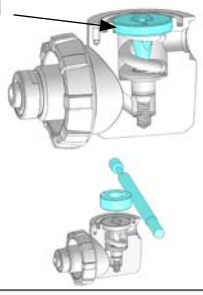
Parts marked with the ( ) symbol are parts that must be replaced at every service. New parts should be stored in it's original packing until it is time for assembly.

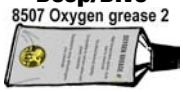
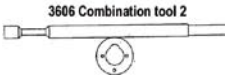
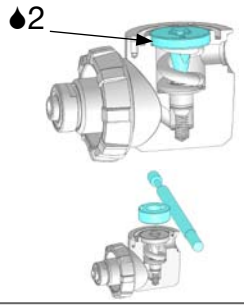
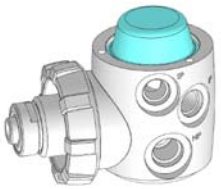
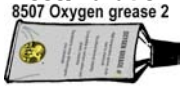
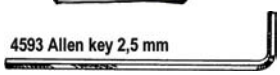
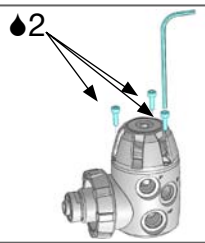
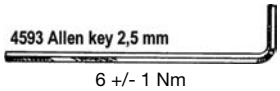
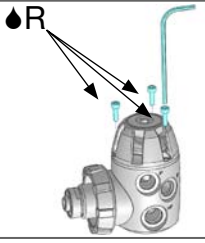
Xstream first stage

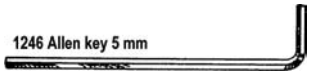
Step	Parts	Tools/Instructions	Replace	Picture
All first stages				
1	4758 Zytel valve seat Xstream		( )	
2a	4557-59 O-ring, viton (Deco/Duration)	**Deco/Duration** 	( )	
2b	4557 O-ring (Deep/Dive)	**Deep/Dive** 	( )	
3	4423 O-ring	Use bushing 4563 to install o-ring		
4	4763 Pin bushing 1.stage Xstream	Make sure fully to the bottom		
5	4777 Lower pin guide Xstream	 3 +/- 1 Nm Refer to section 9 for other units.		

Step	Parts	Tools/Instructions	Replace	Picture
6	4759 Actuating pin, Xstream	8507 Oxygen grease 2 Lubricate pin at top section only. Leaving lower end dry. Wipe off excessive grease under the hat.		2
7	4798 Adjusting screw	1246 Allen key 5 mm		
8a	On blindscrew UNF 3/8” 2782 55 O-ring EPDM Deco 2 or 3 pcs Duration 2 or 3 pcs On blindscrew UNF 7/16” 2918 59 O-ring Viton Deco/Duration 1 pcs	**Deco/Duration** 8515 Oxygen grease 1	( )	1
8b	On blindscrew UNF 3/8” 2782 O-ring Deep 2 or 3 pcs, Dive 5 pcs On blindscrew UNF 7/16” 2918 O-ring Deep 1 pcs, Dive 2 pcs	**Deep/Dive** 8507 Oxygen grease 2	( )	2
Xstream 90 first stage				
9	4552 Cup type filter long Xstream 90		( )	
10	4576-BK Wheel G5/8” Xstream, black 4576-GN Wheel G5/8” Xstream, green 4876-GN Wheel Xstream, green (Duration90 EN144-3)			
11a	2918-59 O-ring Viton (Duration90)	**Duration** 8515 Oxygen grease 1	( )	1
11b	2918 O-ring (Deep90/Dive90)	**Deep/Dive** 8507 Oxygen grease 2	( )	2

Step	Parts	Tools/Instructions	Replace	Picture
12	4576-BK Line protector Xstream, black 4576-GN Line protector Xstream, green			
13	4771 Conn. stem 1.stage 90 Xstream 4878 Conn. stem 1.stage Xstream EN 144-3 (Duration90 EN 144-3)	 Ensure line protector is correctly positioned, with one slot facing to the bottom of the housing Torque setting 30 Nm Refer to section 9 for other units.		
14a	1007 59 O-ring viton (Duration90) 4807-59 O-ring viton EN 144-3 (Duration90 EN 144-3)		↻	
14b	1007 O-ring viton (Deep/Dive)		↻	
Go to step 21				
Xstream bottom mounted first stage				
15	4581 Stainl. washer 1.stage Xstream			
16	4572 Cup type filter Xstream		↻	
17	4572 Cup type filter Xstream		↻	
18	4576-BK Wheel G5/8" Xstream, black 4576-WE Wheel G5/8" Xstream, white 4576-GN Wheel G5/8" Xstream, green 4876-GN Wheel Xstream, green (Duration EN144-3) 4876-WE Wheel Xstream, white (Deco EN144-3)			

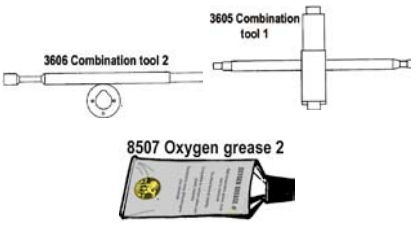
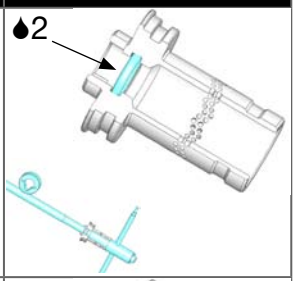
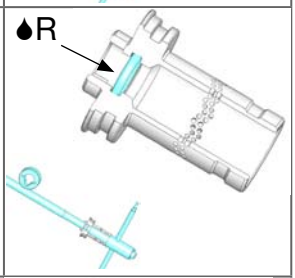
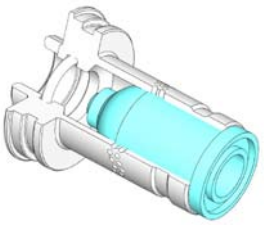
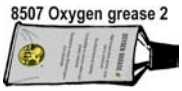
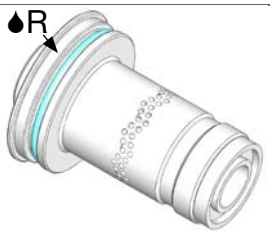
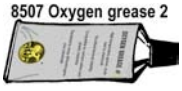
Step	Parts	Tools/Instructions	Replace	Picture
19	4571 Conn. stem 1.stage Xstream 4871 Conn. stem 1.stage Xstream EN 144-3 (Duration EN 144-3/Deco EN 144-3)	 Use handle to hold first stage. Torque setting 30 Nm Refer to section 9 for other units.		
20a	1007-59 O-ring, viton (Deco/Duration) 4807-59 O-ring, viton EN 144-3 (Deco EN 144-3/Duration EN 144-3)		( )	
20b	1007 O-ring (Deep/Dive)		( )	
All first stages				
21	4555 Spring for ball Xstream	⚠ Wider end facing upwards, towards the ball.		
22	4556 Ball 1.stage Xstream			
23	4760 Valve seat holder Xstream 4758 Zytel valve seat Xstream			
24	4761 Valve seat spring Xstream			
25a	Pin guide assembly	**Deco/Duration** 8515 Oxygen grease 1  3606 Combination tool 2  6 +/- 1 Nm Refer to section 9 for other units.		1 

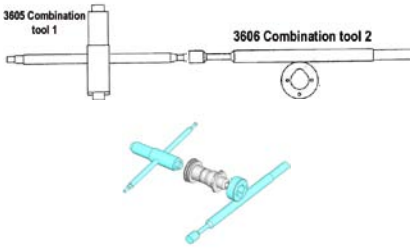
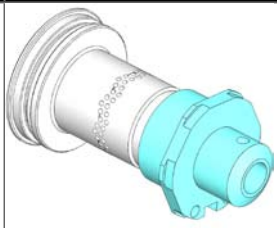
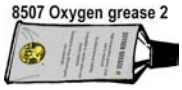
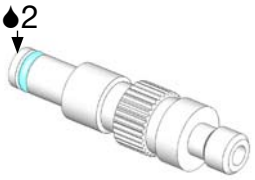
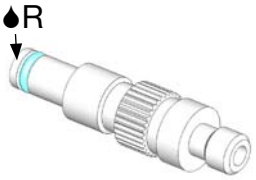
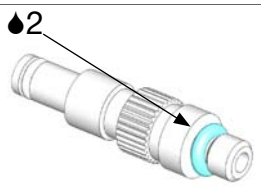
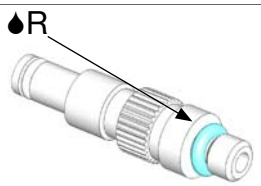
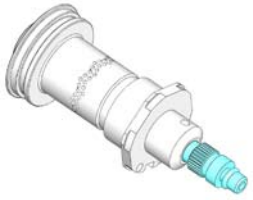
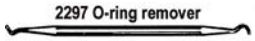
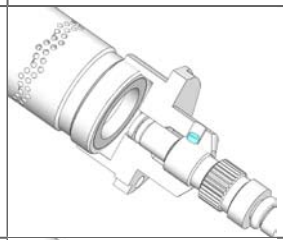
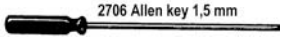
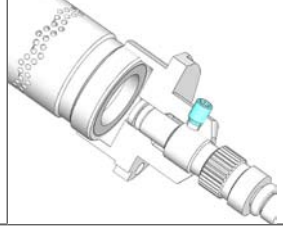
Step	Parts	Tools/Instructions	Replace	Picture
25b	Pin guide assembly	**Deep/Dive** 8507 Oxygen grease 2  3606 Combination tool 2  6 +/- 1 Nm Refer to section 9 for other units.		
26	4564 Roll. diaphragm 1.stage Xstream			
27	4570-BK Barrier 1.stage Xstream black 4570-WE Barrier 1.stage Xstream white 4570-GN Barrier 1.stage Xstream green	⚠ You should see the marking "This side up" on the barrier.		
28	4565 Pressure plate 1.stage Xstream			
29	4766 Adj. spring 1.stage Xstream			
30	4567-BK Cover Xstream first stage, black 4567-CE Cover Xstream first stage, chrome			
31a	4568 Screw cover M3x10 Xstream 3 pcs	**Deco/Duration** 8507 Oxygen grease 2  4593 Allen key 2,5 mm  6 +/- 1 Nm Refer to section 8 for other units.		
31b	4568 Screw cover M3x10 Xstream 3 pcs	**Deep/Dive** 8516 Regulator grease 4593 Allen key 2,5 mm  6 +/- 1 Nm Refer to section 9 for other units.		

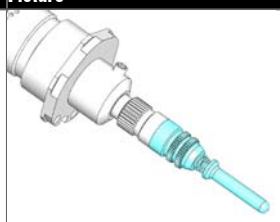
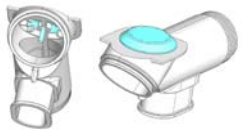
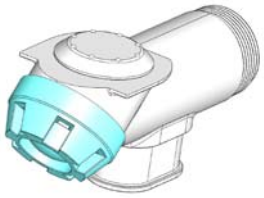
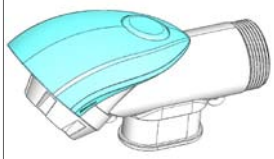
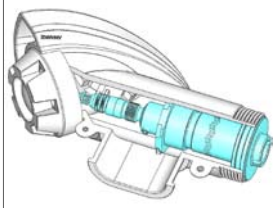
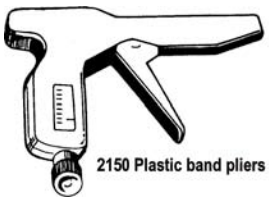
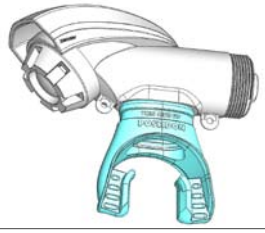
Step	Parts	Tools/Instructions	Replace	Picture
32	2680 Blindscrew UNF 7/16” 1 or 2 pcs 2679 Blindscrew UNF 3/8” 2, 3 or 5 pcs			

Parts marked with the ( ) symbol are parts that must be replace at every service. New parts should be stored in it's original packing until it is time for assembly.

Xstream second stage

Step	Parts		Tools/Instructions	Replace	Picture
1a	2856-59	O-ring Xstream 2nd st., viton	**Deco/Duration** 	( )	
1b	2856-59	O-ring Xstream 2nd st., viton	**Deep/Dive** 	( )	
2	3440	Valve insert			
3a	1145	O-ring	**Deco/Duration** 	( )	
3b	1145	O-ring	**Deep/Dive** 	( )	
4a	1233-55	O-ring 2nd stage Xstream, EPDM	**Deco/Duration** 	( )	
4b	1233-55	O-ring 2nd stage Xstream, EPDM	**Deep/Dive** 	( )	

Step	Parts		Tools/Instructions	Replace	Picture
5	4547	Vavle housing nut, Xstream	 3 +/- 1 Nm		
6a	2876-55	O-ring 2nd stage Xstream, EPDM	**Deco/Duration** 	( )	
6a	2876-55	O-ring 2nd stage Xstream, EPDM	**Deep/Dive** 	( )	
7a	1896-55	O-ring 2nd stage Xstream, EPDM	**Deco/Duration** 	( )	
7b	1896-55	O-ring 2nd stage Xstream, EPDM	**Deep/Dive** 	( )	
8	4534	Valve tube Xstream			
9	2787	Rubber plate		( )	
10	2875	Stop screw			

Step	Parts	Tools/Instructions	Replace	Picture
11	4545 Servo-valve Xstream	Firm by hand		
12	4531 Checkvalve	**ONLY IF REPLACED**		
13	4533 Diaphragm silicone			
13	4536 Diaphragm cover			
14	4538-BK Cover Xstream 2nd stage (Deep) 4538-WE Cover Xstream 2nd stage (Deco) 4538-GN Cover Xstream 2nd stage (Duration) 4538-YW Cover Xstream 2nd stage (Octopus) 4538-GY Cover Xstream 2nd stage (Dive)			
15		Install valve tube		
16	4532 Mouthpiece AIR		( )	

GO TO FINAL INSPECTION

7. Final inspection

Setting, final inspection

Property 1st stage	Setting SI units	Setting common units	Setting US units
P1	30 MPa	300 bar	4351 psi
P2	>750 kPa	> 7.5 bar	>109 psi
P3	2 MPa	20 bar	290 psi
P4@p1, **P4@p3.**	800 – 1100 kPa (unadjustable) 840 – 860 kPa (adjustable)	8bar - 11bar (unadjustable) 8.4bar - 8.6bar (adjustable)	116 - 160 psi (unadjustable) 122 - 125 psi (adjustable)
P5	>750 kPa	> 7.5 bar	>109 psi
i	+/- 110 kPa	+/- 1.1 bar	+/-16 psi
R	max 100 kPa	max 1 bar	max 15 psi
Q	0.12 m^3/h	2 L/min	0.07 ft^3/min
Internal leaktightness		12 ml/h* * Corresponds to a pressure climb of 0,01 bar/min for a regulator with a 70 cm hose.	
Property 2nd stage	**Setting SI units**	**Setting common units**	**Setting US units**
CP (cracking pressure)	-274 Pa to - 392 Pa	-28 to -40 mm.w.c	-1.1 to -1.6 inch of water

Method for regulators cleaned for oxygen use

Unless you do have access to an oxygen cleaned test station, you must ensure you do not re-contamine the regulator when doing the final adjustment and setting. Re-contamination can be caused by e.g. contaminated test gas, contaminated gauge fittings, contaminated regulator connection, contaminated test station pipings etc.

FIRST STAGE SETTING:

1) Slowly open cylinder valve
2) Check IP
3) Close valve
4) Purge
5) Adjust IP (1/2 turn = 1.5 bar)
6) Open valve
7) Check IP (loop to 3)
8) Close valve
9) Purge

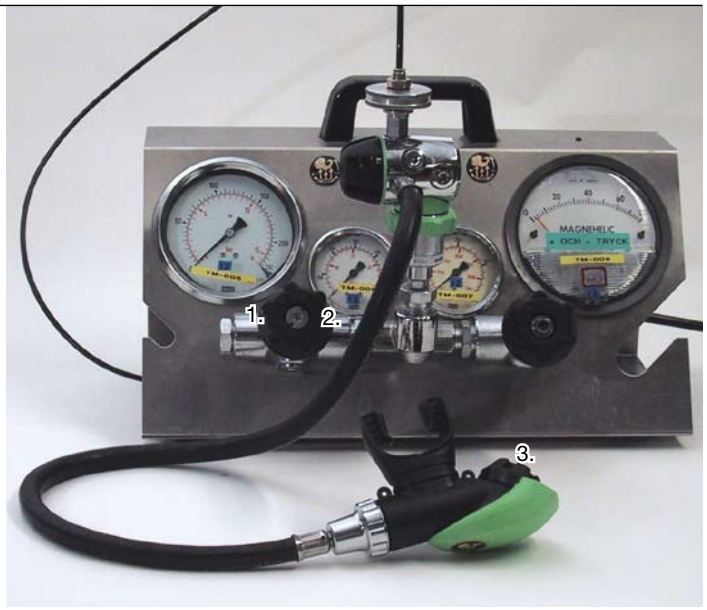
SECOND STAGE SETTING:

1) Open valve
2) Check cracking pressure
3) Adjust cracking pressure
4) Close valve
5) Purge

Method for all other regulators

SYSTEM CHECK:

1) Open left valve 20 bar
2) Close left valve 20 bar
3) Purge



FIRST STAGE SETTING:

1) Open right valve HP (200-300bar)
2) Purge
3) Check IP (go to 9 if OK)
4) Close right valve
5) Purge
6) Adjust IP (1/2 turn = 1.5 bar)
7) Open right valve
8) Check IP (loop to 4)
9) Close right valve
10) Purge
11) Open left valve (20 bar)
12) Check IP
13) Close left valve
14) Purge

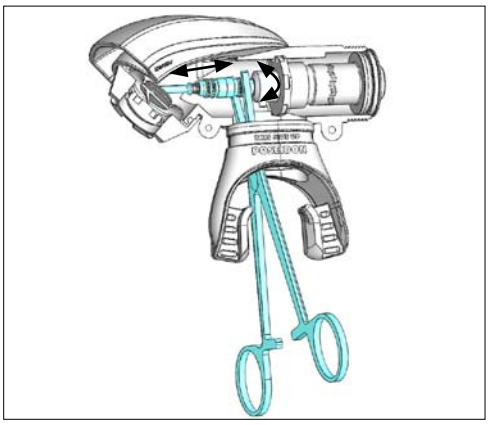
SECOND STAGE SETTING:

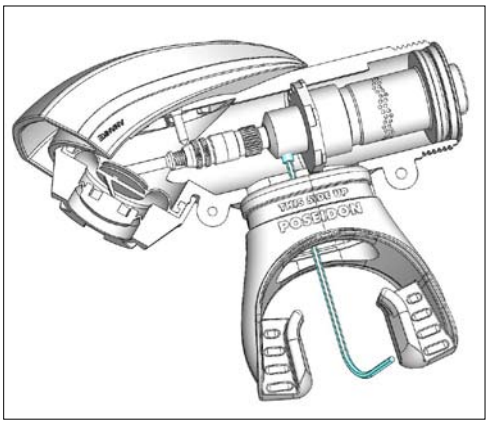
1) Open either left or right valve, whichever gave the lowest IP
2) Check cracking pressure
3) Adjust cracking pressure
4) Close valve
5) Purge

ADJUST THE 2ND STAGE TO 28-40 MM.W.C.

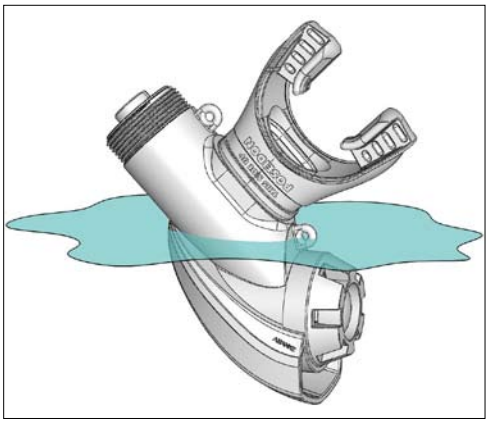
1) Hold the mouthpiece-part of the cracking pressure gauge tight to the outlet of the 2nd stage

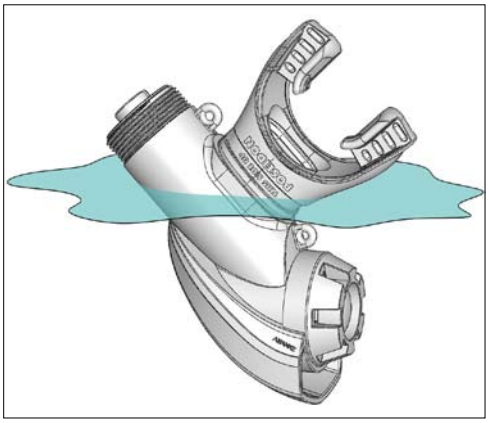
2) Take a few rather slow and long inhalations from the mouthpiece part and simultaneously check the pressure gauge needle. It shall during inhalation reach a maximum of 28-40 mm.w.c, and at the end of the inhalation decrease again. If the reading is too high, unscrew the stopscrew as shown in the illustration below-right. Screw the valve tube away from the diaphragm as shown in illustration to the right. If the reading is too low, screw the valve tube towards the diaphragm. Once the reading is correct tighten the stopscrew and then doublecheck the reading.





3) Alternatively: immerse the 2nd stage as shown in the illustration. A sizzling sound from the servo-valve opening shall occur within the two markings.





TIP!

Some divers like the setting extremely light, and some prefer a higher cracking pressure. Ask your customer. Technically, Xstream can be adjusted from 0 mm.w.c to > 100 mm.w.c. The risk for a free flow increases with decreasing cracking pressure. Below 25 mm.w.c in a certain attitude (exhalation diaphragm the shallowest and inhalation diaphragm the deepest), the regulator inhalation valve will stay permanently open, bubbleing. Above 40 mm.w.c the breath doesn't feel good.

9. Technical data

Torque table

Part subject to torque wrench use	Newton Meter Nm	Inch Pounds Inch-lbs	Foot Pounds Ft-lbs	Kilogram Meter Kgm
Blind screws	6 +/- 1	53 +/- 9	4.4 +/- 0.7	0.6 +/- 0.1
First stage connection stem to body	20 +/- 2	177 +/- 18	17 +/-2	2 +/- 0.2
Centre piece	6 +/- 1	53 +/- 9	4.4 +/- 0.7	0.6 +/- 0.1
Lower centre piece	3 +/- 1	27 +/- 5	2.2 +/- 0.4	0.3 +/- 0.05
2nd stage	3 +/- 1	27 +/- 5	2.2 +/- 0.4	0.3 +/- 0.05
Hose to 1st stage	6 +/- 1	53 +/- 9	4.4 +/- 0.7	0.6 +/- 0.1
Cover screws 1st stage	6 +/- 1	53 +/- 9	4.4 +/- 0.7	0.6 +/- 0.1
Valve house nut	3 +/- 1	27 +/- 5	2.2 +/- 0.4	0.3 +/- 0.05
Servo valve	Firm by hand	Firm by hand	Firm by hand	Firm by hand
Hose to 2:nd stage	Firm by hand	Firm by hand	Firm by hand	Firm by hand

Product data

General:		
Maximum Operational depth	Certified to 200 m (656 ft)	
Typical Work of Breathing 50m on air, 62.5 l/min	1.5 J/l (see diagrams below)	
Typical Work of breathing 200m on Trimix, 62.5 l/min	1.7 J/l (see diagrams below)	
Approved gas	Dive	Air
	Deep	Air / Trimix
	Duration,EN 144-3	Air / EAN 50
	Deco,EN 144-3	Air / Oxygen
Maximum working pressure	300 bar (4351 psi)	
Cold water performance	Exceeding EN 250 requirements for cold water use	
Approvals	Type Approved acc. to EU Directive Personal Protective Equipment 89/686/EEC	
Applicable Performance Standards	EN 738-1, clause 6.6, 6.6.2 NORSOK U-101 clause 5.2-5.5, 5.9 EN 250:2000	
Cleaned to hydrocarbon levels < 50mg/m2 & particle level X	Dive	No
	Deep	No
	Duration/EN 144-3	Yes
	Deco/EN 144-3	Yes
O-ring materials	Dive	Nitrile, EPDM,Viton
	Deep	Nitrile, EPDM,Viton
	Duration/EN 144-3	Viton, EPDM, Nitrile
	Deco/EN 144-3	Viton, EPDM, Nitrile
Lubricants	Poseidon 1; BAM appr. 270 bar @ 100°C Poseidon 2; BAM appr. 140 bar @ 100°C Poseidon R; silicone oil.	
Colour	Dive	Grey
	Deep	Black
	Duration/EN 144-3	Green
	Deco/EN 144-3	White
	Octopus	Yellow
Warranty	24 months	
2nd stage		
Flow Rate	>2150 l/min STPD (>76 scfm)	
Inner Volume (dead space)	49.5 ml (3 in^3)	
Weight	l52 g (5.4 oz)	
Technique	Upstream servo-valve	
Safety valve opening pressure	18 +/- 1 bar (261 +/- 14 psi)	
Swivelling	Around axis, can be used either side	
Material	ASA, Brass, TPU, Silicone, PU	
Venturi assist	Automatic	
Inhalation control	Automatic	
Surgical cord	Silicone	
Dismountable w/o tools	Yes	
Anatomic Mouthpiece	4532 Poseidon AIR	

1st stage		
Flowrate (l/min)	>4000 l/min (>141 scfm)	
Nominal inter-stage pressure	8.5 bar (123 psi)	
Weight (with 70cm hose)	Deep Duration/EN 144-3 Deco/EN 144-3	920 g
	Dive Deep 90 Dur. 90/EN 144-3	1100 g
Anti-Freeze protection	Built in T.D.A	
Technique	Rolling diaphragm	
Valve technique	Ball valve	
Seat material	Zytel	
Test pressure	450 bar (6526 psi)	
Ports*	Dive	5 IP (UNF 3/8") / 2 HP (UNF 7/16")
	Deep Duration/EN 144-3 Deco/EN 144-3	4 IP (UNF 3/8") / 1 HP (UNF 7/16")
	Deep 90 Dur. 90/EN 144-3	5 IP (UNF 3/8") / 2 HP (UNF 7/16")
Connection	Dive	DIN 477, G5/8" – Yoke adapter available
	Deep	DIN 477, G5/8" – Yoke adapter available
	Duration	DIN 477, G5/8" – EN 144-3 (upgradeable)
	Duration EN 144-3	EN 144-3/M26x2
	Deco	DIN 477, G5/8" – EN 144-3 (upgradeable)
	Deco EN 144-3	EN 144-3/M26x2
Material	Brass, plastics, stainless steel	
Hose		
Standard lengths hose	0.7 m (2.3 ft) 0.9 m (3 ft) 1.6 m (5.2 ft) 2.15 m (7 ft)	
Burst pressure	>100 bar (1450 psi)	
Pull strength	>1000 Newton (225 lbf)	
Material	Reinforced NBR/SR	
Safety inspection holes	Both ends	
Wear protecting crimps	Both ends	
Oxygen cleaned	Available	

* Some of the older models of the bottom/side mounted Xstream hade 2 IP and 1HP/3 IP 1HP ports. The specified ports for the different models are available from 2005

Conversion tables

www.onlineconversion.com

Known	Unknown	Multiply by
Bar	psi	14.5
Psi	bar	0.07
mm.w.c	mbar	0.1
mbar	mm.w.c	10
litre	ft^3	0.0353
ft^3	litre	28.32
m	ft	3.28
ft	m	0.305
Nm	poundfoot	0.7375
Poundfoot	Nm	1.356

Performance

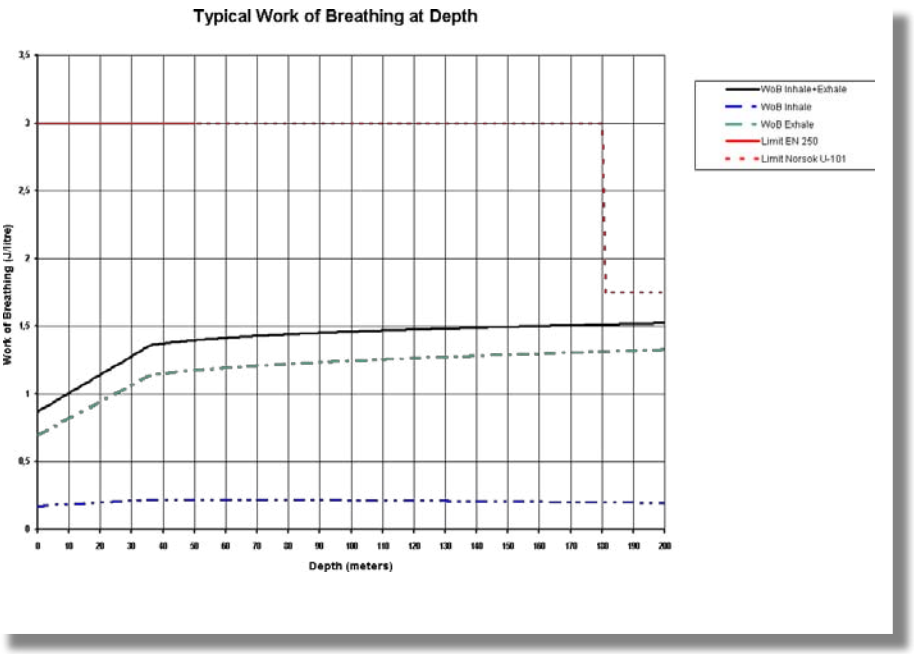
Work of breathing

The diagram to the right show a calculated graph for Work of Breathing in Joules/litre at $Q_{average}$=62.5 litres/min. The equation behind it, is extracted from hundreds of tests, from which coefficients for gas dependency, average flow dependency, and depth dependency is calculated.

Its maximum inaccuracy is within +/- 10%

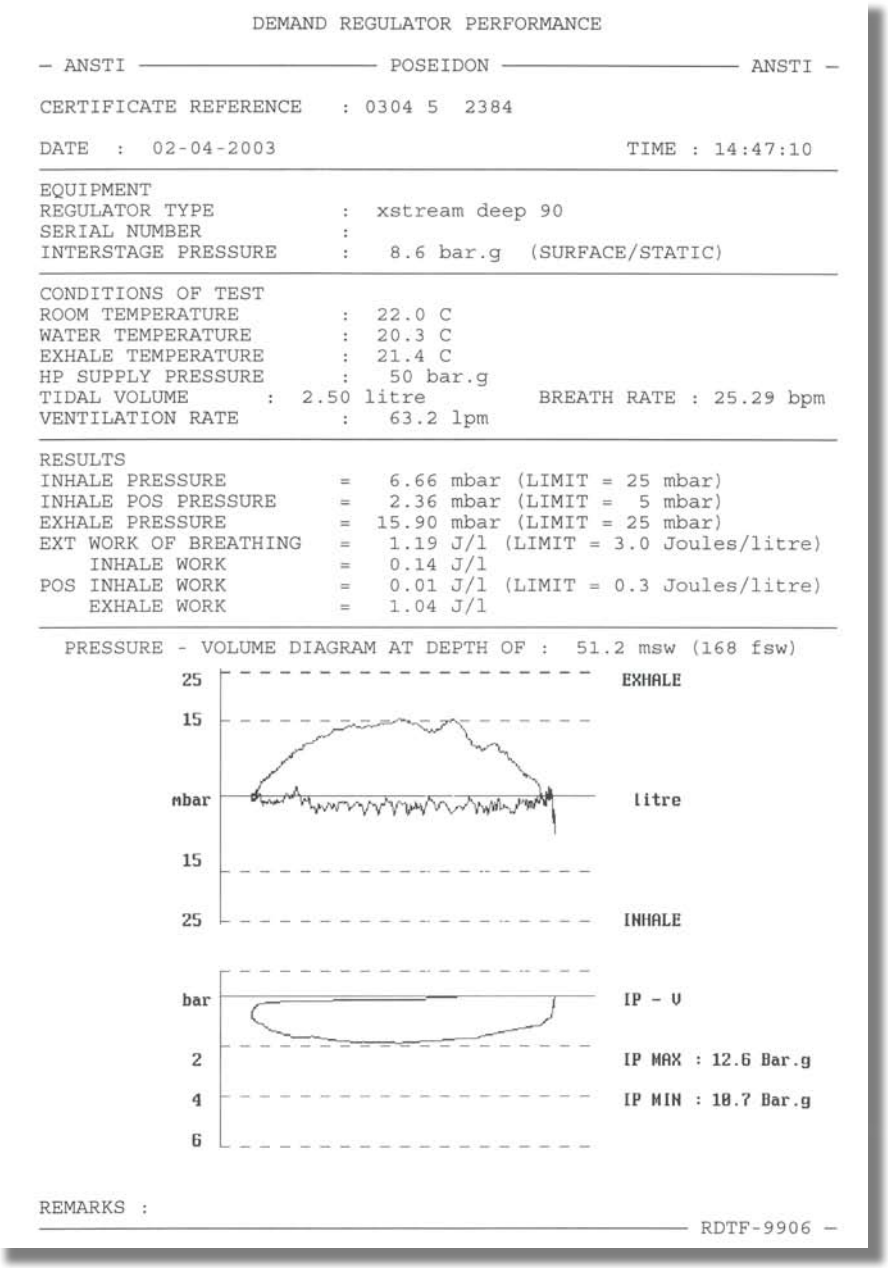
The equation assumes the most dense gas possible to safely breath is used, i.e. a maximum tolerable pO_2, pN_2 at any depth. Adding more Helium will lower the figures.

It is important to understand that this equation does not apply to any other regulator, since the coefficients and characteristics are strongly dependent on the regulator construction.



Breathing curve

The diagram below shows a breathing curve for Xstream.


DEMAND REGULATOR PERFORMANCE
ANSTI POSEIDON ANSTI
CERTIFICATE REFERENCE : 0304 5 2384
DATE : 02-04-2003 TIME : 14:47:10
EQUIPMENT
REGULATOR TYPE : xstream deep 90
SERIAL NUMBER :
INTERSTAGE PRESSURE : 8.6 bar.g (SURFACE/STATIC)
CONDITIONS OF TEST
ROOM TEMPERATURE : 22.0 C
WATER TEMPERATURE : 20.3 C
EXHALE TEMPERATURE : 21.4 C
HP SUPPLY PRESSURE : 50 bar.g
TIDAL VOLUME : 2.50 litre BREATH RATE : 25.29 bpm
VENTILATION RATE : 63.2 lpm
RESULTS
INHALE PRESSURE = 6.66 mbar (LIMIT = 25 mbar)
INHALE POS PRESSURE = 2.36 mbar (LIMIT = 5 mbar)
EXHALE PRESSURE = 15.90 mbar (LIMIT = 25 mbar)
EXT WORK OF BREATHING = 1.19 J/l (LIMIT = 3.0 Joules/litre)
INHALE WORK = 0.14 J/l
POS INHALE WORK = 0.01 J/l (LIMIT = 0.3 Joules/litre)
EXHALE WORK = 1.04 J/l
PRESSURE - VOLUME DIAGRAM AT DEPTH OF : 51.2 msw (168 fsw)
25
15
mbar
15
25
EXHALE
litre
INHALE
bar
2
4
6
IP - V
IP MAX : 12.6 Bar.g
IP MIN : 10.7 Bar.g
REMARKS :
RDTF-9906

10. Oxygen statement

The Poseidon Xstream Deco, Duration and Duration90 are all approved for use with gaseous oxygen up to 99.95 % purity at maximum 300 bar supply pressure and a maximum gas temperature of 60˚C

Using gaseous mixtures containing oxygen at high pressure always presents a certain level of risk for equipment failure due to combustion. Greater concentration oxygen, greater pressure, greater temperature, respectively represents factors that contributes to increase the mentioned risk.

In diving operations, the use of oxygen is essential for the human metabolism. In addition, oxygen concentration levels greater than in air, can improve safety, especially but not only, by lowering the risk for DCS and Nitrogen narcosis.

Therefore, Poseidon has taken every precaution using “state of the art” technology, expertise, industrial standards, and knowledge to lower the risk as far as possible. Both Xstream Deco and Xstream Duration are engineered for oxygen use, assembled and cleaned in a clean room environment, made up by materials chosen to expose lowest possible risk x failure-effect product, and are tested and approved for oxygen use.

It is strictly prohibited to use the Poseidon Xstream Deco/Duration with oxygen (ref. “definitions”) without being fully trained and certified in the use of oxygen by a recognised training agency. Failure to have such training and certification could lead to death or serious personal injury.

It is likewise absolutely essential that the end user strictly follows the mandatory guidelines given in the users manual for the Xstream models. Regular maintenance, servicing and cleaning is a prerequisite for keeping the risk as low as possible.

Servicing and cleaning must be carried out by an authorised oxygen service dealer. Poseidon has developed and verified a servicing and cleaning method, which guarantee acceptable levels of contaminations. Poseidon can not be held responsible for the effects of other un-verified cleaning and servicing methods.

Failure to adhere to these mandatory requirements transfers the responsibility to the owner.

11. Trouble shooting

Effect	Examine	Reason	Action
Over pressure valve is opening	Is it only when hose is pulled?	If yes, it is its normal function	None
	Is it spontaneously opening?	If yes, it may be a 1st stage error	Service & replacement of 3440.
Immersed in water, small bubbles are coming from the mouthpiece	Check the cracking pressure (see section 5.1)	If the cracking pessure is too low, the valve is sligtly opened	Adjust the cracking pressure
	Does it stop after the regulator is rinsed?	If yes, the valve was probably jammed with salt crystals	Instruct owner always to rinse the regulator after every dive, using fresh water
	The bubbles remain	The servo valve is severly jammed by salt crystals	Service & Instruct owner always to rinse the regulator after every dive, using fresh water
The regulator free flows breaking the surface	Check the cracking pressure (see section 5.1)	If the cracking pessure is too low, it increases the risk for free-flow	Adjust the cracking pressure
		If the regulator hits the surface at a certain attitude, it can start a free-flow	Instruct owner to either immerse slowly, keep regulator in your mouth, or hold your hand over the free mouthpice while entering the water
Outward leakages at extremely cold conditions		Incorrect or damaged ”o”-rings	Service
The IP increases beyond max limit		Damaged HP seat and/or ”o”-ring	Service
The 2nd stage is hard to adjust to a correct cracking pressure	Servo valve	If the servo valve is bent to an angle, its rotation upon the setting procedure will alter the setting, and be self readjusting when used thereafter	Replace servo valve
Sieze of gas	Valve insert 3440 and 1st stage leakage	If the valve insert 3440 has been suppressed to excessive pressure for a longer period of time it can be damaged. Reason being 1st stage failure.	Service & replacement of 3440.

12. Updates

Version	Date	Updated by	Comments
1.0	2003-03-20	Poseidon	First issue
1.1	2003-05-07	Poseidon	Changes in section 5. Item numbers.
2	2004-09-24	Poseidon	EN 144-3
2.1	2005-02-11	Poseidon	Change in stage 26 of Service level B regarding the Pin bushing
2.2	2007-03-05	Poseidon	Updated with new 1st stage article numbers. Changes in service levels.

APPENDIX A

FAQ(T)'s

What shall be used, viton or nitrile?
In short, viton is less likely to ignite but if it does the fumes are extremely toxic. Nitrile is more likely to ignite and releases more heat energy than viton, but the fumes are less toxic. Nitrile has normally better mechanical properties, i.e. it is a better and more reliable seal. Therefore, the risk for, and the consequences of either a failure because of ignition or a loss of seal, determines whether viton or nitrile shall be used.

What about the 40% rule?
In the past some claimed that using gasses containing les than 40% oxygen did not require any special procedures such as e.g. oxygen cleaning. Since it is only a matter of what level of risk that can be accepted, and Poseidon's standpoint is to lower the risk as far as possible for our customers safety,

Upstream valve and sieze of gas?
The servo valve of the Xstream (and Jetstream) is an upstream opening valve. Because of its small size, an extremely small force is required to crack it open and thereby allow the main valve to open. Even if there is a first stage failure increasing the Interstage pressure, the Interstage pressure will never be greater than twice the originally set IP because of the OPV. In this situation, the cracking pressure will be doubled, but still very small why the regulator will work normally.

Unadjustable, will it keep its setting?
Spontaneous alteration of setting is most commonly due to fatigue of springs. Significant fatigue only occur if the spring is stressed beyond its plastic deformation threshold. A correctly chosen spring will therefore not fatigue and keep its setting.

Can I use Christo-Lube instead?
As per 31/1 2003 Christo-Lube 111 is approved for use with 100% oxygen to 110 bar at 60°C, which is less than the maximum working pressure of Xstream Deco and can therefore not be used. Poseidon 1 Grease is approved for100% oxygen to 270 bar at 100°C.

Can I put a Jetstream 2nd stage on an Xstream 1st stage?
Yes.

Can I put a Cyklon 5000 2nd stage on an Xstream 1st stage?
This combination is not CE-approved. The Cyklon 5000 2nd stage require an IP at 11.5 bar which can only be set with a Xstream 1st stage that has an adjustment screw.

What is the expected service life of the servo valve?
If handled in accordance with the instructions given in the users manual, it is not something that should be expected to need any replacement. The most common problem is ingress of water due to immersion of an unpressurised regulator. In such case, salt crystals can form inside the servo valve and create a minor leakage.

Why do Poseidon refer to NORSOK U-101 TBD?
NORSOK U-101 is a Norwegian off-shore standard for testing diving equipment's performance down to 400m (1312 ft) depth. Its requirements put greater demands on breathing resistance than EN 250 does.

Why isn't Xstream marked EN 250?
EN 250 requires a limitation in use to maximum 50m depth. Xstream is tested and fulfil all requirements of the EN 250, except for it is not limited to 50m, but to 200m depth

APPENDIX B

Fundamental oxygen risks comprehension

For a fire to occur, three elements must be present. A fuel, an oxidiser, and an ignition source. If any of these three is non present, combustion cannot take place. All regulators being used with a gas containing any percentage oxygen, exhibits all these elements and therefore the risk of a fire is present – ranging from extremely low risk to extremely high risk. The ignitability of the fuel, the concentration of oxygen, and the number of ignition sources and their likelihood to occur determines the level of risk exposed.

Everything can combust in an oxygen rich atmosphere, i.e. all materials can be regarded as fuels. Polymers and organic materials are oftenly more easily ignitable than metals, why they shall be avoided as far as possible in a regulator intended for oxygen rich mixtures, in order to lower the risk for combustion.

Gaseous oxygen is a strong oxidiser. The higher concentration, the higher temperature, and the higher pressure – the greater its oxidising properties.

What you as a regulator service technician can do to reduce the risk, is to remove the ignition sources.

- Particulate
- Auto ignition
- Electrical sparks
- Adiabatic Compression
- Heat
- Frictional heat
- Resonance (heat)

Ideally, if you could remove them all, there would be no risk for combustion.

Particulate material can ignite in at least two ways. A small particulate travelling at high speed in a geseous stream can, when it hits a surface, create either a spark or transfer enough energy to trigger the absorbing materials auto ignition temperature. Or second, since a cluster of particulate material exhibits a large surface area, it can pick up e.g. resonance heat more effectivcely and thereby reach its own AIT. Particulates must therefore be removed effectively.

All materials have a threshold temperature upon reached the material will start to burn automatically, the Auto Ignition Temperature, AIT. The AIT depends on oxygen concentration, such as at a higher concentration the lower threshold. Hydrocarbons (oil, fingerprints, grease) have a very low AIT, and are almost certain to combust in an oxygen rich environment at high pressures.

Combustion, if it occurs, can be anything from unnoticeable to catastrophic. A low mass of e.g. some Nylon-like plastic materials will only produce fumes containing carbon-dioxid and water. Other plastics, e.g. viton, will produce hydroflouric acids, which even in extremely low concentrations can kill a diver if inhaled. Viton has a significantly higher AIT than Nylons, why it is far less likely to burn if compared in exactly the same situation. But the effects if it happens in a regulator is far worse.

Different materials when burning releases different amounts of energy. Hydrocarbons have a high heat of combustion. The produced heat can in turn act as an ignition source for less ignitable materials, producing what's referred to as a kindling chain reaction. Thereby, the presence of materials with low AIT and high HC, can ignite the nextcoming part downstream, which in turn possibly can ignite...etc.

There are no level of percentage of oxygen which can be guaranteed as safe. There are only factors which increases or decreases the risk for combustion.

The O_4 concept

Poseidon has introduced the O_4 concept, which stands for oxygen engineered, oxygen compatible, oxygen clean, and oxygen approved.

O_1 In short, oxygen engineered is taking every step to lower both the risk for combustion and the possible effect of combustion. The design must reduce the number of ignition sources, allow effective maintenance and cleaning, materials must be selected as to break kindling chain reactions, constructed to minimise effects of compression shocks etc.

O_2 Oxygen compatible is selecting materials which have the best combination of AIT, HC, OI, and the severity of a possible failure for its function in the sytem.

O_3 Oxygen clean means that either a component or a complete system is cleaned from especially hydrocarbons and particulate to a level which gives an acceptible risk for ignition.

O_4 Oxygen approved means the product has passed tests conducted by independent organisations according to international standards.

APPENDIX C

Nomenclature regulator performance

1st stage regulator performance

The nomenclature to describe the regulator is as far as possible in accordance with EN ISO 2503:1998.

Rated maximum inlet pressure, p1

Rated maximum inlet pressure for which the pressure regulator is designed

- *p1 = 300 bar(4351psi)*

Rated (maximum) outlet pressure, p2

Rated (maximum) downstream pressure for the standards discharge specified (Q1). Figure taken at p1.

- *p2 = > 7.5 bar(109psi)*

Lower test pressure, p3

- *p3 = 20 bar(290psi)*

Stabilized outlet pressure, p4@p1

Stabilzed oulet pressure after flow (Q1) ceases, often referred to as Interstage pressure or Intermediate pressure. Figure is taken at p1.

- *Unadjustable : 8bar < p4@p1 < 11bar (116psi < p4@p1 < 160psi)*
- *Adjustable: 8.4bar<p4@p1<8.6bar (122psi < p4@p1 < 125psi)*

Stabilized outlet pressure, p4@p3

Stabilzed oulet pressure after flow (Q1) ceases, often referred to as Interstage pressure or Intermediate pressure. Figure is taken at p3.

- *Unadjustable : 8bar < p4@p1 < 11bar (116psi < p4@p1 < 160psi)*
- *Adjustable: 8.4bar<p4@p1<8.6bar (122psi < p4@p1 < 125psi)*

Outlet pressure p5

Highest or lowest value of the outlet pressure (see figure) during a test where the inlet pressure varies from p1 to p3 for a flow equal to the standard discharge Q1. p5 is taken at 20-50 bar (290 - 725 psi)

- *p5 = > 7.5 bar*

Irregularity coefficient (balance), i

The coefficient i is defined by:

- *i = P4@p1 – p4@p3*
- *i = +/- 1.1 bar (+/-16psi)*

Coefficient of pressure increase upon closure, R

The coefficient R is defined by:

- *R = p4 – p2*
- *R = max 1 bar(max 15psi)*

Standard discharge Q1

Corresponds approximately to a very light breath from the second stage.

- *Q1=2 L/min (0.07 ft^3/min).*

Leakage

Leakages above 12ml/h is regarded as a leak. Judgement shall be made after 1 minute of settling time, where after a p4 increase greater than 0.01 bar/min is regarded a leakage.

This magnitude of leakage corresponds to an IP increase of 10 bars in 16 hours in a standard Xstream regulator w/ 70cm hose (27.5”)

APPENDIX D

Cleanroom and oxygen cleaning requirement

Check list

1. Cleanroom / work environment requirements		**OK**
1.1	The work area must be dedicated only for oxygen servicing. Ideally a separate room or at least a space clearly marked out as an oxygen clean area, e.g. by floor marking, signs, and/or screens. Ceiling, walls, and floor shall be non-contaminant producing and be easily cleaned. If the location is not sufficient in this respect, sheets of polyethylene plastic can be taped to fully surround the work area.	
1.2	The work area must be free from airborne dust and droplets. It shall never be close to areas where machining takes place, compressors are running, or other activities which can produce a mist containing hydrocarbons or other flammable or particulate contaminants.	
1.3	The work bench shall be sufficient in size as to enable a good organization of equipment, tools and the regulator parts. A clean polyethylene plastic sheet shall be used to protect the work bench. It is recommended to have a roll of plastic sheet at one end of the work bench. Used sheets shall be disposed if there are any signs of contamination.	
1.4	Items incompatible with oxygen such as e.g. hydrocarbon oil and grease must not be stored or ever used in the area.	
1.5	Oil, grease, residue, spilled chemicals, and any foreign material which develop in the area shall be cleaned immediately. At least monthly the clean room shall be completely cleaned.	
1.6	It is recommended to keep cleanroom temperature close to standard room temperature and humidity less than 50%. Since all tools will be kept free from grease, the risk of them rusting increases the higher the humidity.	
1.7	It is recommended to see to that the work area maintain a slight positive pressure so that the air flow will always be outward from the clean area.	
1.8	The following activities are absolutely prohibited inside the cleanroom area: • Smoking • Eating • The use of car heaters	
2. Personnel clothing requirements		**OK**
2.1	The special clothing as described below must not be worn or taken outside the cleanroom.	
2.2	Lint free gloves shall be worn. Regard everything you touch as contaminated, unless you are sure it is clean. This means you shall replace your gloves if they have been in contact with something you can suspect being contaminated.	
2.3	In the clean room a hair net and a coverall / laboratory coat shall be worn.	
2.4	These requirements apply to anyone being in the cleanroom, including visitors and observers.	
3. Tools and equipment requirements		**OK**
	The cleaning procedure as described for the regulator also applies to all tools and equipment used.	
3.1	All tools and equipment used must be cleaned and kept clean. It must be ensured that tools and equipment from this area is not shared with other servicing locations. Tools used to disassemble the regulator must be regarded as contaminated, and cannot be used for assembly unless they have been cleaned after the disassembly stage. We therefore recommend having two sets of the required tools, one of which is always kept clean.	
3.2	Tools have to be re-cleaned every month or after 10 serviced regulators, whichever comes first.	
3.3	An ultra-sonic cleaner Poseidon XXXX shall be used. In addition to the instructions for use and maintenance in the users manual, the bath shall be cleaned with IPA and a lint free mop or lint free paper on a regular basis, or when contamination can be suspected. This is to ensure that a possible trace of an oil-film on the inside of the bath is removed.	
3.4	The solution in the ultrasonic bath shall be replaced after a) maximum 30 times of use, b) earlier if signs of contamination is present, c) at least every fourth week.	
4. Rinsing water requirements		**OK**
4.1	Water quality must be in level with or better than: Chloride ion (ppm) — 1,0 maximum Conductivity (µ /cm³) — 20 maximum Resistivity (cm³/) — 50K minimum pH — 6-8 Visual clarity — No turbidity, oil, or sediment	
4.2	A chemical analysis of the water quality shall be conducted at least annually by an independent laboratory.	
5. Gas requirements		**OK**
5.1	Gas used for blow-guns and for regulator testing must fulfill the following requirements: **Maximum level of:** CO — 2 ppm CO_2 — 500 ppm Water dew point — -45°C (-50°F) Lubricants (droplets/mist) — 0.5mg/ m³ Water — 35 mg/ m³ 39ppm Gaseous hydrocarbons — 15 ppm Condensed hydrocarbons — 0.1 mg/m³ Solid particles — 2 microns	
5.2	A gas analysis of the gas quality shall be conducted at least annually by an independent laboratory for the gas used to dry cleaned parts.	
5.3	It is strongly recommended to use filtered air for the purpose of drying and regulator testing.	
6. Disposal		**OK**
6.1	Disposal of water shall be in accordance with local, state, or federal regulations	
7. Documentation		**OK**
7.1	The Poseidon Oxygen Service Center must have documented maintenance procedures/routines covering: 7.1.1 Cleanroom cleaning 7.1.2 Tool cleaning	

APPENDIX E

Oxygen service authorisation

Xstream and Oxygen Service Technician

To become an authorised Xstream and Oxygen Service Technician you must attend an approved Poseidon Xstream and Oxygen handling, service course. The service course should strictly follow this service manual. The only ones approved to hold such a course are Poseidon or Poseidon distributors. After completed course a diploma will be issued as a proof of authorisation.

Xstream and Oxygen Service Center

To become an authorised Xstream and Oxygen Service Center you must have access to a cleanroom environment and all the special tools mentioned in this servicemanual. Service should only be performed by an approved Xstream and Oxygen Service Technician. Once the conditions are fulfilled, an approved Poseidon Xstream and Oxygen center sticker should be placed clearly visible on for example; the shopdoor.

Service should always be done in line with the rules and guidelines of this servicemanual.

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Service manual Xstream item # 10069-XM